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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Bonding of Imported Chemicals

WE understand from the British Chemical and Dyestuffs Traders' Association that the Customs regulations for the bonding of goods scheduled in List "H" (Chemical Section) of the articles chargeable with duty under Part I of the Safeguarding of Industries Act have been completed. The arrangement is expected to come into operation almost immediately, and it is hoped to prepare for the use of chemical merchants a list of warehousing firms licensed for the storage of imported chemicals in bond. It may be useful to summarise the chief features of the system.

When goods which it is desired to put into bond arrive at a British port, the usual Key Industry Duty entry and declaration of value will be made and the goods will pass into a bonded warehouse without payment of duty. When they are taken out of bond the value, for the purpose of assessing the amount of duty payable, will be that declared by the importer and accepted by the Customs at the time of importation. Fluctuations, one way or the other, in the market during the period the goods have been in bond will not be taken into account. Importers putting goods into bond will be permitted to take out any quantity from time to time, provided it does not necessitate the breaking of any intact package. If, for example, 50 packages are put into bond at one time, 1, 2, 3, 4 or any number may be taken out and duty paid on that number, but it must be distinctly understood that the Customs authorities will not permit importers who may be in the habit of bringing in one case containing various dutiable chemicals to break that package in bond and take out part of the contents. Importers must see that such consignments are shipped as separate packages. Customs will not permit the repacking of goods in bond, but they will allow firms to obliterate or change the usual markings on packages. For re-export business the bonding system will do away with the necessity of applying for "drawbacks." For home trade, duty need only be paid at the time the goods are taken out of bond.

We are afraid that the Prime Minister's statement of the Government's economic policy in the House of Commons, on Wednesday, in which particular reference was made to fine chemicals, scientific glassware, and scientific instruments, gives little ground for any hope of improvement from the trader's outlook. The principle of the safeguarding of industries is to be widely extended in a Bill to be introduced early in the new year, and it may therefore be assumed that the existing provisions for the protection of the fine chemical and dyestuffs industries will not be modified.

The Future of the Newer Fertilisers

THE attention drawn to the prospects and position of all forms of fertilisers in this country by the rapid progress made at Billingham has set going a good deal of discussion as to the likelihood of the newer fertilisers coming to the front and being accepted by the rather conservative agriculturist with a faith equal to that which he places in names familiar to him for years. The most prominent of these new materials are, of course, nitrate of lime, nitrate of ammonia, and urea, and to these one should probably add chloride of ammonia and the more recently tested bicarbonate. Only recently attention was drawn in these columns to the means whereby at Billingham the primary nitrogen product is being converted into the finished fertiliser without the use of acid; and as this (on account of the expenditure entailed in utilising acid) is a principle which must continue to prove attractive to the manufacturer, it would be gathered that ammonium chloride is not likely to be neglected. In the same way that ammonium sulphate can be produced by interaction between ammonia and calcium sulphate, so is it possible to produce ammonium chloride without the direct use of acid, namely, by employing synthetic ammonia in the Solvay ammonia-soda process, when ammonium chloride is recovered as a by-product.

The main question is, however, whether all these new nitrogenous fertilisers will be able, merely owing to the law of supply and demand, to establish them-

selves on the British market. It was, we think, Sir E. J. Russell who recently expressed the opinion that with a normal annual output of some 400,000 tons of sulphate of ammonia there is available in this country a quantity far in excess of what the farmer can use. Accordingly, it is scarcely to be expected that the consumer will prove an enthusiastic buyer of what to him are unknown quantities, while there is an excess of those materials he has tried and proved over many years. However, it is generally known that ammonium nitrate and urea are in the Billingham programme, and it is well to bear in mind how their qualities compare with the more familiar substances. Nitrate of ammonia is recognised as probably one of the most effective nitrogenous fertilisers available, particularly as the ammonia is in the form of nitrate, and has, therefore, no exhausting effect on the lime in the soil. Against the great advantages exhibited by the material, there must, however, be placed the serious risk of deliquescence, and until this risk is greatly reduced it is unlikely that the nitrate compound will find an important place in the markets. Urea, perhaps, has greater attractions, for, apart from its being the most concentrated of all nitrogen compounds, it is exceptionally free from harmful effects on the soil, and Sir E. J. Russell has definitely stated that tests have shown it to be of the same order of value as sulphate of ammonia and nitrate of soda, but without the drawbacks of the latter. The position at least shows signs of becoming interesting, for if continued experience proves that the newer fertilisers are superior to the older ones, then it would seem that the consumer will be almost precluded from obtaining the most effective substance merely because the market is already fully supplied by existing materials.

The Indian Sulphur Duty

THE recent report of the Indian Tariff Board on the question of the abolition of the Indian import duty on sulphur contains some interesting points on the industry. The Board came unanimously to the conclusion that the import duty on all kinds of sulphur should be removed, namely, Rs. 15 a ton on rough sulphur, Rs. 18 on flowers of sulphur, and Rs. 21 on roll sulphur. They regard the reasons in favour of the abolition as strong. Sulphur, they point out, is neither produced nor likely to be produced in India, and no domestic interest can, therefore, be affected. On the other hand, they hold that the removal of the duty would be of substantial benefit to the chemical industry and the manufacture of fertilisers, as well as to other industries. For the three years before the war there was an average import into India of 5,764 tons of sulphur. The figures for the last four years are: 1920-1, 10,592 tons; 1921-2, 6,277 tons; 1922-3, 9,026 tons; 1923-4, 12,067 tons. The only industrial applications of sulphur the Board were asked to consider were in connection with the production of insecticides and sulphuric acid.

During the inquiry only one instance was given of workable deposits of sulphur in India, and owing to the distance from industrial centres the railway freight on transport rendered them of little or no commercial value. Nor does India possess workable deposits of sulphur ores, such as pyrites. A few years ago the Burma Corporation and an iron and steel company were interested in a scheme for the manufacture of sulphuric acid from zinc concentrates obtained from the Corporation's mines in Burma. A large amount of money was spent on the scheme, but it was eventually abandoned. The whole of the sulphur used in India has, therefore, to be imported, and the Indian manufacturer of sulphuric acid complains that the cost of freight and the import duty places him at a serious disadvantage. Figures supplied during the inquiry gave the average cost to users of sulphur in India as from Rs. 115 to Rs. 125 per ton, as compared with Rs. 40 to Rs. 50 in America, and Rs. 60 to Rs. 70 in England. The abolition of the duty would not, of course, equalise prices, but would result in a certain degree of relief.

The evidence submitted to the Board showed the chief industrial uses of sulphuric acid in India to be the manufacture of fertilisers (such as superphosphates and ammonium sulphate), nitric and hydrochloric acids, Epsom salts, and aluminium sulphate, together with smaller uses in the steel, electrical, dyeing, and other industries. The small use hitherto made of artificial manures in India is recognised in the report as "a reproach to Indian agriculture," and it is suggested that cheaper sulphuric acid, by lowering the prices of chemical manures, might induce the *raiyat* to buy them. While sulphate of ammonia is the chief chemical fertiliser manufactured in India, the Board consider it unfortunate that only a small proportion of the home production is used in the country. The bulk is exported to Java and Mauritius, for use in the sugar plantations, and to Ceylon—markets, of course, in which it has to compete with sulphate imported from other countries. During the inquiry some of the concerns interested desired to put before the Board proposals for increased duties on imported chemicals; but these, of course, were outside the terms of reference. The evidence, however, made it clear to the Board that chemicals were being imported into India at very low prices, and that the growth of the home industry, in face of foreign competition, would be difficult. "The removal," they state, "of the duty on sulphur would do something to cheapen the cost of producing chemicals in India, and it is very desirable that help should be given in this form." Inevitably in all these tariff problems, there are two points of view, and the view of the Indian chemical manufacturer who wants to keep our foreign chemicals will not be the view of the British manufacturer anxious to retain his market there.

An Inquiry About "Schlempe"

A CORRESPONDENT who is interested in the cyanide industry wrote to us recently for information relating to a substance called "Schlempe," from which, he had been told, cyanides might be extracted. The inquiry is not without interest, for the substance, or at least the foreign name, is in all probability something in the nature of a novelty to most of our readers; it is, indeed, quite a few years since we

came in contact with it. With a term such as this, one is not likely to get much assistance from the average dictionary; but perhaps we shall not be very far wrong in saying that, strictly, it refers to a lye or wash-liquor which is obtained in the operations of the distillery. In this particular instance, however, it obviously refers to a waste product which is derived from the manufacture of beet sugar, and which consists of a brown liquor containing the impurities of the original beet juice, a small proportion of nitrogen, and a good deal of potash. Originally the "Schlempe" was burnt for the recovery of the potash, but Dr. Bueb, whose work in connection with cyanide processes is so well known, worked out a process which was, we understand, applied with successful results, for recovering the nitrogen content (entirely lost in the old burning process) in the form of cyanide compounds. In fact, up to some five years ago the process was in operation in quite a number of works in Germany, but we have no information as to what has happened to it in later years.

Briefly, the method consists of distilling the "Schlempe" in retorts in much the same way as coal is carbonised; when, in addition to a number of commoner gases, trimethylamine and ammonia are evolved. The gaseous mixture is then passed through chequer-brick vessels, which are maintained at a temperature of about 1,000° C., when the trimethylamine is decomposed with the direct formation of hydrocyanic acid and methane, the reaction being as follows:

$$N(CH_3)_3 = HCN + 2CH_4.$$

The gas is then cooled, and is afterwards passed through dilute sulphuric acid, where the ammonia and any other alkaline constituents are removed. Finally, the hydrocyanic acid is absorbed in water, treated with sodium hydroxide, and eventually obtained as a concentrated solution of sodium cyanide. Bueb stated that of the total nitrogen contained in the original "Schlempe" about 35 to 40 per cent. could in this way be recovered as cyanide, and about 25 per cent. as ammonia, the remainder being lost.

The process, from the technical point of view, has its interest, even though that interest may now be only historical. Our correspondent is, however, most anxious to obtain information as to its present-day utility and commercial feasibility. Perhaps some of our readers may have come in contact with the process during post-war years, in which case we should be glad to have our own information supplemented and brought down to date.

"C.A." Annual Review Number

THE Annual Review Number of THE CHEMICAL AGE, which has become widely known as an authoritative and critical record of chemical developments for some years past, will be published next week, the issue (in consequence of Christmas Day falling on Thursday) going to press early on Tuesday. We are again indebted to a number of distinguished contributors. In addition to a carefully prepared summary of the principal events of 1924, Dr. E. B. Maxted will write on the nitrogen industry; Major L. B. Holliday on the year's progress in the British dyestuffs industry; Mr. P. Parrish on developments in the heavy chemical trade; our Patents correspondent on the chemical inventions of the year; Mr. H. Talbot on chemical engineering developments; Mr. Wilson-Jones on the fine chemical industry; and Mr. N. V. S. Knibbs on the British lime industry. Mr. W. G. Wilson, owing to his absence in Germany, has been unable to complete his valuable commercial review of the British chemical trade in time for this issue, but we hope to publish it in the first number in the new year. In addition, there will be short summaries of the work of the principal chemical and allied organisations. As the Annual Review Number is used so largely by chemists at home and abroad for reference purposes, there is usually a heavy demand for it, and to avoid disappointment orders should be placed early.

Meanwhile it only remains to wish our readers at home and abroad a Merry Christmas and a Prosperous New Year.

"Punch" Among the Chemists

THE current issue of *Punch* has two jokes which may interest without convulsing our readers. Number one:—

> Now that Lord Ashfield is chairman of the British Dyestuffs Corporation we may expect a new shade called "crushed straphanger" any day now.

Habitual politeness alone restrains us from suggesting that the perpetrator of this deserves at least the strap, even if the severer sentence of hanging be respited. The second is certainly better:—

> "ERRATA:—*for* 'anhydrocarboxyphenylaminotetrahydrocarbazoleacetic acid' *read* '5-keto-5 : 10 : 16 : 17 : 18 : 19-hexahydroacrindoline-21 acetic acid.'"—*Scientific Journal.*

We breathe again.

But here, alas, one is grieved by the insensitiveness of the overworked joke distiller to the two most subtle beauties of the passage—the first, the terseness with which the accomplished chemist can put a whole essay into one rhythmical and idiomatic line; the second, the perfect balance of the metrical pointing, equalling, we should say, anything in a Scottish Psalter.

Points from Our News Pages

Dr. H. A. Prager concludes his review of conditions in the British dyestuffs industry (p. 620).

The Midland chemists' dinner at Birmingham and the Ramsay Chemical dinner at Glasgow are reported on pp. 622 and 623.

A testimonial is proposed to mark Professor E. Knecht's long and valuable association with the Society of Dyers and Colourists (p. 625.)

Our London market report is very favourable in spite of the season, and consumers are contracting ahead (p. 632).

The Scottish report reveals an improvement in the Heavy Chemical market and considerable inquiry (p. 635).

The Calendar

Dec. 23	Hull Chemical and Engineering Society: "The Development of Unattended Navigation Lights." A. E. Butterfield. 7.45 p.m.	Grey Street, Park Street, Hull
1925 Jan. 6	West Yorkshire Metallurgical Society: "The Value of some Workshop and Laboratory Tests." 7.30 p.m.	George Hotel, Huddersfield.

The British Dyestuffs Industry as Seen by a Neutral.—(II)

By H. A. Prager, Dr. ès Sc.

We give this week the concluding portion of the article in which the writer reviews the position of the British Dyestuffs Industry and offers suggestions for reconstruction. It may be added that Dr. Prager has for some time been resident in London

When the manufacture of a new product is considered the following course is invariably taken: the product is prepared in the laboratory, the properties and possibilities for its application thoroughly investigated, the manufacturing cost price calculated, and the likely business prospects ascertained. If they seem to be satisfactory, the process of manufacture is more accurately laid down by carrying through a batch with larger quantities in a semi-technical plant. The large-scale plant is thereupon designed, erected, and the manufacture handed to one of the departments. The sale of the new product is pushed by the sales and commercial departments. It may be added that the plant is generally designed to allow the manufacture of various products. If the market for the new production is falling off, manufacture is then changed over to another compound and the plant is not allowed to stand idle.

The commercial department is in charge of the business side of the company. It is also a most elaborately organised body with many sub-departments. The commercial director is at the head of the whole concern and is responsible for satisfactory working conditions. The commercial department is composed of the following principal sections:—Book-keeping and accountants' department, purchasing and selling department, advertising department, transport office, cost office, patent office, literature and library.

The sales department is a most important section and is generally well organised, having travellers and agents in all parts of the globe where business seems possible. The commercial side of a company is as important as the manufacturing side, and neither will be successful without the well-working and co-operation of the other. It is comparatively easy to sell if the manufacturing side is giving satisfaction. If this is not the case and the quality of the goods becomes inferior and the price high, the finest organisation cannot bring success, and trouble arises with the consumers.

Essential Points

Summing up, we may say that for any progressive manufacturing concern the following points should be realised:—

The technical and commercial departments should be soundly organised to ensure the most economical manufacture of good quality products, and efficient sale of the goods. The business should be self-supporting to a high degree, and laid out on a basis which ensures development from its own resources. It is, therefore, of equal importance to have a capable board of directors able to exercise control and to define the right policy of the company and put it into effect. It is only on this basis that the success of the industry is assured.

An organisation such as has been described may be found in many cases, but if the various positions are not filled by the right men the concern does not work, and is only there in name. The motto should be "Employ the best staff and pay them well, and effect economy by sound manufacture."

Reviewing again the present position of the British dyestuff industry, we may say that it was largely a creation of the war, meant to fill the gap when supplies ran short, and the consumer's most urgent needs for the running of his business had to be satisfied. The effort was wholly successful considering the many great difficulties, and every respect is due to the energetic enterprise of that time. Had it remained a war measure only, and had manufacture been discontinued when supplies were again forthcoming after the war, nothing else could have been said. However, the various works, once in existence, wanted to continue their business, and far-reaching reconstruction had consequently to be effected in order to turn them into business propositions in ordinary times. Protection was granted by the Government in passing the famous Dyestuffs Act in 1920, in order to enable manufacturers to establish themselves on sound lines. In consequence fresh activity set in after a long period of slump, but efforts were not always made in the right direction. Instead of remodelling the whole organisation and in the first instance establishing present manufactures on sound economic lines, new dyestuffs were introduced by the score with barely sufficient regard to the economic side of production, as under the Dyestuffs Act the goods could be sold with profit. This new apparent prosperity, often at the expense of the consumer, has no merit, and does not meet the aim of the Dyestuffs Act. It is not difficult to produce irrespective of costs, and there is neither glory nor a desirable aim in it. It does not constitute a guarantee for future prosperity if sound reorganisation does not go hand in hand with it, as protection has distinctly been granted for the purpose of retaining a necessary industry in the country.

Can Britain Compete with Germany?

The question has sometimes been asked: "*Will it be possible for the British dyestuff making concerns to compete with German firms in time to come?*" The answer is in the affirmative, but only if these companies are conducted on the same sound principles.

The main source of raw material, coal tar, is available in any desired quantity in this country, and the fundamental intermediates are quoted at figures similar to those on the Continent. All the other items—*e.g.*, staff, labour, power, steam, coal, plant, etc., are not more expensive, and, moreover, constitute a comparatively small percentage of the final costs. What is mainly needed now is a well-trained reliable staff with experience and ability and suitable workmen and foremen who have been trained for their work. The enormous importance attached to this item in Continental companies is shown by the extraordinary care taken in every single case when a new member is added to the staff. A thorough university training, experience, and sound knowledge are qualifications *sine qua non*. Members of the staff and workmen are thoroughly educated to their tasks by their superiors, and their continuous service is ensured by giving them long-term working agreements and benefits in all schemes introduced for the purpose of ensuring their lasting services to their employers. Houses are allocated to members of the company according to their positions, the housing colonies of the big Continental concerns being a well-known feature. Accident insurance, free medical treatment, the payment of pensions to the employee and his wife are some other features. There are club-houses and welfare institutions, the company, so to speak, forming a State in the State.

Manufacture, with the aid of such a trained staff and workmen, proceeds naturally very smoothly, and it is clear that in order to obtain similar results a similar course of training and long service must be adopted over here. The average British chemist has a sound knowledge, and is willing and reliable, but in order that he may be able to fulfil his tasks efficiently he must be educated to them. The right men are available, and it is up to the heads of the departments and directors to make them into useful members.

It is clear from all that has been said that a good all-round knowledge and experience must be expected from those who have to fill the positions of departmental managers and directors. The choosing of the right men here will be a deciding factor in the proper conduct of the business. It may be said that these men can also be found. The most important position of technical director and chief of research should not be filled by a mere scientist, but by an officer taken from the ranks of the industry.

Such is the reconstruction which should take place without delay.

Foreign Dyestuffs Still Imported

If we look at the list of dyestuffs imported into this country it will be found that the value in money of such imports is still considerable, the larger proportion being due to dyestuffs of the more expensive and complicated type. It must naturally be the aim of a company to take up these manufactures at the works, but it must be done in a proper manner, that is, either on the sound and economic lines indicated before or not at all. Otherwise the consumer will not be thankful for this effort nor will it help the company along. It is the practice to introduce

the manufacture of such imported dyestuffs, although the conditions which should rule such a decision are not fulfilled. Apparently anybody who has ever been connected with these respective manufactures may be entrusted with a process, and I have thus met former photographers, shoemakers, and grocers in charge of manufacturing plants. How can building up on such lines meet future competition? Such a policy is detrimental to the stabilisation of the industry, and against the spirit of the Dyestuffs Act. Sound organisation and a good business policy, supported by a reliable, experienced, and highly trained staff of officers, is an incalculable asset, but it is not created by the mere fact of establishing a company by means of capital; it is a result of systematic work and development achieved by the leaders, who must have the stern will and qualifications to do it. The same course of procedure will have to be taken over here wherever it has not been done already.

In the course of development it is generally realised in a company what is essential for efficient manufacture. Any defects in the organisation must be routed out in good time, and the process of putting matters right shortened as much as possible. The whole procedure might be compared with an illness which must be cured, and if this is not done in time the illness may kill the body. In order words, the harmonious and efficient co-operation of all departments in a firm must be the essential feature.

The Proposed I.G. Agreement

It is interesting to notice that the biggest concern in this country, the B.D.C., has also realised the immense importance of a well-trained, efficient technical staff and workmen, which it felt could alone bring lasting success. Whether the proposed agreement with the I.G. would ultimately have brought the desired results is yet questionable, as there is hardly any desire on the other side to help the industry out of their own country. There is, on the contrary, every sign that they try to retain it. The continental concerns would, no doubt, have sent over here their people and introduced the manufacture of a large series of colours and conducted the production on efficient lines. This combined with a large output would soon have turned the B.D.C. into a prosperous concern. Whether the intended manufactures were to be restricted to the type of Azo Colours, Sulphur Colours, etc., or intended to include as well the expensive and more complicated class of colours, I do not know. Under this system the continental makers would endeavour to retain the bigger portion of this particular trade, as otherwise they might lose it after the return to normal conditions, considering the many new companies which had been formed during the war. This refers in particular to the manufacture of the simpler types of colours—*e.g.*, Azo-sulphur Colours, etc., where no great improvements in manufacture are anticipated and small profits are made, as it is probable that new companies would ultimately produce these dyestuffs at the same low costs, leaving no margin for competition. But provided even that the manufacture of the expensive and more complicated type of colours, which allow larger profits, had been introduced as well, yet the new business might still have been conducted on the usual lines of a branch firm, which do not allow of independent development. In other words, there would have been efficient manufacture in this country, but the soul of the business would have been on the other side.

It must be borne in mind that a dyestuff making concern is not a mere trading proposition, but a manufacturing company, where the methods of production undergo continuous transformation. The creative body, which must be able to keep pace with any new developments, is a vital accessory to such a business, and without it there is no further progress. The manufacture of the more complicated class of colours is still an open field, and the dyestuff situation may become greatly changed in the future, when the price of fast colours is reduced to the level of other colours. Would the continental makers have reorganised the B.D.C. on the lines of a creative body, so that the company could have developed independently its own manufactures and defined its own policy?

An alternative course to the proposed agreement with the I.G. should be considered, as this arrangement would anyhow have been unfair to other manufacturers in this country who, induced by the protection granted under the Dyestuffs Act, have also invested their money in the industry.

Success Still Possible

It should yet be possible to establish the B.D.C. on a sound footing considering the favourable conditions of trade afforded by the Government's protection. It can only be brought about by reorganisation on the aforesaid lines and vast production. The B.D.C. is a large concern, and consequently only an adequate output of goods in proportion to the size of the company can meet the cost of current expenses. To effect economy in cutting down expenses by operating only part of the available plant is a fictitious method, as the costs and maintenance, rates, etc., are there all the same and will consequently increase the cost of production. The overhead charges will then form too high a proportion of the cost price of the goods and paralyse business by making the final price prohibitive. Large production and turnover is the only remedy. It must be realised that there is no alternative.

This may not seem an easy task, as the right men will have to be found possessing the knowledge to suggest the right manufactures and having the qualifications to carry them into effect. Chemists and engineers capable of taking charge as chiefs of the manufacturing departments, guaranteeing efficient manufacture on sound lines, and reliable workmen and foremen have to be found and trained. In short, sound knowledge and experience of first-class manufacture are required, and in addition efficient staff to carry out the ideas.

Such reorganisation will, no doubt, mean a heavy financial burden, but it will bring a return. The knowledge and staff can be found, and the company once run on these lines will, as far as can be foreseen, develop into a successful enterprise.

I am given to understand that the B.D.C. has a fine plant and well equipped laboratories, etc., at its disposal. Nothing should, therefore, interfere with the above measures of reconstruction. It is certainly a fortunate feature that saving has not been effected by putting down inefficient plant. This would have involved higher expenses when reconstructing. Under the present circumstances it should almost be possible to reduce the expenses involved by reconstruction to the bigger outlay incurred on account of larger production.

In conclusion, this article may not seem as encouraging as the usual publications forthcoming on the subject. Less optimism may, however, cause fewer disappointments, and on the other hand inspire greater efforts.

Will the reader kindly remember that this article is written by a neutral, not in a spirit of criticism of this industry, but as a faithful attempt to contribute to the question of reconstruction? The writer's aim will have been fulfilled if any reader finds a useful hint or a practical idea for his own schemes of remodelling his business.

Oxygen Prices: Eliminating Transport Costs

In the past the price of compressed oxygen has been conditioned by the distance of the buyer's works from one of the large supply stations. The producing company has not found it worth while to erect plants for local needs, each station supplying a large area. A new system introduced by Liquid Air, Ltd., of Queen's Park, London, is intended to overcome this difficulty. By improved methods of rectification this company is able to erect plants for an economical output as low as 30,000 cu. ft. per week.

In many industrial areas it is found that one or more firms consume relatively large quantities of oxygen, while in the same district there is a large number of small consumers. In such cases Liquid Air, Ltd., have erected oxygen plants in conjunction with one of the larger consumers, the plant having perhaps double the output required for the one works. This allows of economical working, and at the same time provides cheap oxygen for local sale.

A plant with a weekly output of 70,000 cu. ft. erected recently at Birkenhead in conjunction with the shipbuilding yards of Cammell Laird, Ltd., and one of 120,000 cu. ft. erected at Dundee, in conjunction with the Caledon Shipbuilding and Engineering Co., Ltd., illustrate the economy of the new system in practice. Oxygen in Dundee had previously been brought from Scotland, the cost being about 60s. per 1,000 cu. ft. The gas from the Caledon plant is being supplied at 37s. 6d. per 1,000 cu. ft.

The saving to be effected in any particular case depends, of course, on the actual distance cylinders have at present to be transported. At the same time, it is contended, a large consumer can always make his own oxygen more cheaply with one of these plants than he can buy it in the open market.

Society of Chemical Industry

Papers on "3:3-Diethylpentane" and "Silica in Plant Growth" at Birmingham

AT a meeting of the Birmingham and Midland Section of the Society of Chemical Industry, held at the University of Birmingham on Tuesday, December 9, Dr. Twiss (Dunlop Rubber Co.) presided, and a paper on "3 : 3-Diethylpentane" was contributed by Professor G.T.Morgan, Mr. S. R. Carter, and Mr. A. Duck (Chemical Department, University of Birmingham). 3 : 3-diethylpentane or tetraethylmethane, $C(C_2H_5)_4$, a tertiary paraffin, it was pointed out, was of especial interest as having the most symmetrical structure of all the theoretically possible nonanes. From the general inorganic viewpoint this hydrocarbon acquired additional significance owing to the circumstance that it might also be regarded as the initial member required to complete the following periodic series :— $C(C_2H_5)_4$, $Si(C_2H_5)_4$, $Ge(C_2H_5)_4$, $Sn(C_2H_5)_4$, $Pb(C_2H_5)_4$. This paraffin had now been synthesised from diethylketone by the application of the Grignard and Frankland reactions as summarised in the following scheme :—

$$(C_2H_5)_2CO \; (C_2H_5)_3\,C.OH \rightarrow (C_2H_5)_3.I \rightarrow C(C_2H_5)_4.$$

The hydrocarbon was a colourless liquid with a characteristic camphoraceous odour, having a melting point $-41° \pm 1°$, and boiling point 139·2°/760 mm. In its chemical properties diethylpentane exhibited the inertness which characterised a paraffin hydrocarbon. It did not decolorise bromine water or alkaline permanganate, neither was it attacked by concentrated sulphuric or nitric acids. Its physical properties, including the vapour density, liquid density, molecular volume, surface tension and refractive index, had been determined. A comparison of these properties with those of other hydrocarbons demonstrated the mono-molecular characters of 3 : 3-diethylpentane. Moreover, they accorded with the compactness and perfect symmetry which would be associated with the structural formula of tetraethylmethane.

Increasing the Efficiency of Petrol

Mr. S. R. CARTER mentioned that the analogue, lead tetraethyl, had recently obtained some commercial importance by reason of the fact that it had been added to petrol for increasing its efficiency. It was discovered to be a valuable constituent for minimising the so-called "knock" in motor combustion engines. Unfortunately, several deaths had occurred in America from the use of this substance, and it had been prohibited by authorities in the United States. So far as he was aware, it had not been brought into use in this country.

The CHAIRMAN observed that most of the properties of ordinary petrol and this hydrocarbon were practically identical : the only difference was in some of the more intimate features.

Mr. ROSSITER, British Cyanides Co., said it was quite true that in America several experimental chemists were killed owing to the extremely poisonous properties of lead tetraethyl. Consequently panic legislation was passed by some of the American States, and the use of the compound in petrol was prohibited. A more sensible view of the position was now being taken. The amount used was minute ; and, according to the American technical journals, it seemed that the exhaust from petrol engines, which were treated with this compound, was no more dangerous than the ordinary poisonous gases which were always produced in ordinary internal combustion engines.

Dr. GLOVER inquired as to the toxicity of the new hydrocarbon, and Mr. CARTER said it was a matter for satisfaction to hear that the poisonous character of lead tetraethyl had been exaggerated. It was used in the proportion of one part to a thousand in ordinary petrol. In that state he did not think it was poisonous ; he thought the mischief arose during its manufacture, when it would be in a concentrated form. If tetraethylmethane could be prepared in any quantity it would probably function as an "anti-knock" recipe. Carbon tetrachloride was in use, in some cases, already. As to the toxic effects, he did not think they need expect this paraffin to be any more poisonous than other paraffins which could be regarded as practically harmless.

Silica in Plant Growth

Messrs. D. R. NANJI and W. S. SHAW (Bio-Chemical and Brewing Department of the Birmingham University) contributed a paper on the "Rôle of Silica in Plant Growth ; its Assimilation and Physiological Relation to Phosphoric Acid." From the time that Liebig first propounded his "mineral theory" of plant concentration it had been universally recognised that there are certain elements absolutely essential for the normal nutrition of plants. According to this doctrine the fertility of the soil and the efficiency of manure were solely ascribed to the nature and assimilability of the manurial constituents comprising them. It was soon recognised, however, that the fertility of a soil was not directly proportional to the amount of its manurial constituents, but that it was influenced considerably by the nature of the organic nutritive minerals. Our view on the artificial fertilisation of land had undergone considerable modification, more especially when viewed from the standpoint of the colloidal and the biological conditions existing in the soil. We have come to regard elements such as nitrogen, phosphorus, potassium, calcium, magnesium, sodium, sulphur and iron as requisite for perfect growth, and in addition it was now held that certain elements such as boron, fluorine, iodine, silicon, aluminium, manganese and zinc, which had been known to exert a toxic effect towards plants when present in concentrations above a certain limit, had, in fact, when presented to plants in very minute amounts not only a stimulating and beneficial effect, but might even be essential in some cases. Experience had taught agriculturists that silica-free plants were at a disadvantage compared with plants grown with the normal supply of silica. Silica was capable of increasing growth ; and such beneficial effect was particularly marked in the case of soils deficient in phosphorus, as had long been experienced in Rothamsted field experiments. Details were given of experiments showing the relationships of the element silicon to phosphorus.

Midland Chemists' Dinner

A Representative Gathering

THE annual dinner of the Society of Chemical Industry and the Institute of Chemistry (Birmingham and Midland Section) was held on Saturday, December 13, at the Queen's Hotel, Birmingham. Professor G. T. Morgan (chairman of the Birmingham and Midland Section of the Society of Chemical Industry and the Institute of Chemistry) presided.

The toast, "Chemistry and Industry," was submitted by Professor BURSTALL, who said that he saw quite clearly from comparatively recent developments in chemistry what a large part it was going to play in our civilisation in the future. He referred in particular to the remarkable work done in the domain of bio-chemistry, and to the great developments in connection with synthetic drugs and the artificial silk industry. He thought that greater attention might be directed to the application of science to the production of food which would be available for use merely by the heating of it, and which would obviate much of the waste that now went on.

Educating the Public

Mr. W. J. U. WOOLCOCK, replying, observed that the chemist had played a very distinguished part in the development and industrial life of this country, but there was a lot to be done in inculcating in the public mind the function of the chemist and the great part he was playing. A great deal had been done in this direction at Wembley, and the cost of the exhibit —over £100,000—was justified, because it answered the question—Germany or this country ? A few years ago, when the word "chemical" was mentioned persons were apt to think at once of Germany. But that was not the case to-day. He knew, standing as he did between the two great bodies—the profession and the industry—that there existed in this country the closest possible co-operation between the two. With a continuity of that spirit and effort British chemistry was bound to come to the top.

Mr. J. T. BELL (President of the Birmingham Pharmaceutical Association), in proposing "The Institute of Chemistry," said that the Institute had always had a peculiarly close

relationship to Birmingham, and outlined the history of the various chemical societies.

The Institute's Activities

Professor G. G. HENDERSON (President of the Institute of Chemistry) responded. He attached, he said, the utmost importance to such meetings in the cultivation of that professional spirit which was to his mind absolutely essential if their profession was ultimately to occupy that position which it ought to occupy, one of equality with the other learned professions in the country. The primary function of the Institute was to promote the welfare of the profession; it had a direct and personal interest in all its members, and it was not only willing, but eager, to provide them with information and advice and, if necessary, as in times of great stress, to give financial help. Their profession occupied a much more prominent position than it did 50 years ago; and to this elevation of the status several causes had contributed. He had no hesitation in saying that the foundation of the Society of Chemical Industry had a great influence for good in that direction. The men who laid the foundations of that society determined that it should be built up of sections—self-governing sections, each of them endowed with independence within limits, but all linked together by a central body, upon the council of which each section was represented. Thus, chemists from all parts of the country came together with a common aim and purpose, and in this way they got a better understanding of one another's position. But he felt that the principal influence in promoting the development of the profession of the chemist was the steady unceasing work which had been carried on by the Institute of Chemistry for 50 years.. He hoped to see the day when every chemist in the country would become a member of the Institute. For then, and he thought not till then, they would be able to speak, if it became necessary, upon matters of national importance.

Using the Press

The chemists' duty was to place their work before the mass of the people of the country. He did not like the word "educate," but he believed firmly that the one real successful method of reaching the people was by utilising the great Press of the country, and he believed it was sympathetic and would be co-operative. It only wanted to be provided with the necessary information.

The toast of "The Guests" was proposed by Professor G. T. MORGAN, and Professor J. G. SMITH replied.

During the evening Professor Henderson presented to Mr. A. Appleyard, a lecturer in bio-chemistry in India, a diploma conferring the qualification of F.I.C. (without examination).

The Chemist and Industrial Development

Speeches at the Ramsay Chemical Dinner

THE important part played by the chemist in modern industrial development was the theme of several speakers at the Ramsay Chemical dinner, Glasgow, briefly reported in our last issue. The dinner was held under the combined auspices of the Society of Chemical Industry, the Institute of Chemistry, the Society of Dyers and Colourists, the Glasgow University Alchemists' Club, the Andersonian Chemical Society, and the Ardeer Chemical Club. The chair was occupied by Mr. W. J. U. Woolcock.

Sir Robert Bruce proposed the toast of "The Profession," and the chairman, in replying, expressed on behalf of the chemical industry of the country its great appreciation of the services which were being rendered by *The Glasgow Herald* in familiarising the public with the important part played by chemists in the post-war industry of the country. The importance of chemistry and of the chemist in industry, he said, could hardly be over-estimated at the present time, for the simple reason that the whole structure of modern industry was built up on chemical reaction. If they were to ask Professor Henderson what was the most important chemical reaction in the industrial world he would probably tell them that it was $C+O_2=CO_2+97{,}000$ calories. That was to say, when 12 grams of carbon were burnt with 32 grams of oxygen there were produced 44 grams of carbon dioxide and 97,000 units of heat. That simple chemical reaction evolved so much energy that it had taxed the greatest scientific minds for the last 150 years to discover how to extract it and convert it into useful work. The trouble was that all chemical energy was in an extremely concentrated form, and so far no mechanism had been invented to convert that energy into use without incurring great loss. Even to-day, in the most up-to-date electric power-generating station, only 20 per cent. of the energy contained in the coal was sent out as current. The usual process was from coal to combustion; steam, mechanical energy; and electrical energy—with losses at every stage—making all together the huge total of 80 per cent. of loss of the energy at the start. This extremely important chemical reaction, called combustion or burning, would not be displaced as the basis of their industry until the scientist discovered how to extract the energy more economically from other sources.

Necessity of Economy

The best they could hope for at the moment was that every stage of the process should be carefully studied and every economy seized upon. It was therefore the duty of every one who possessed skill and knowledge to carry on research so as to improve the mechanism of conversion and thus reduce the enormous waste. In addition to the provision of power for a thousand and one different purposes by means of that chemical reaction or combustion, the large deposits of coal had enabled us to build up such important industries as heavy chemicals, coke and by-products, iron, steel, glass, bricks, cement, and many others, all of which took large supplies of coal and coke for direct use. These industries sent great masses of their products to other industries, and it was only by the application of chemical and scientific knowledge, combined with practical experience, that waste could be eliminated. He supposed that if one had to choose one particular thing as being the most important, he would choose cellulose. This might be called the day of cellulose. The Glasgow engineer had a very proud record. One thought of him as associated with the triple expansion engine and the turbine, but they would realise that the engineer began by using cellulose. Only there was this difference, that the engineer waited about a million years until the cellulose was sufficiently disintegrated and had become coal. The chemist was the man to whom the country would have to look for short cuts. The country could not afford to wait for a million years for the disintegration of the cellulose. Mr. Woolcock concluded by an interesting reference to the early development of the chemical industry at the St. Rollox Works in Glasgow.

Dr. Levinstein proposed the "City of Glasgow," and in a reply it was mentioned that on the question of smoke abatement it was hoped that further progress would be made shortly by the invention of a Glasgow chemist working in Glasgow.

Chemical Exhibition at the Institute

ON Wednesday the London and South Eastern Counties Section of the Institute of Chemistry held an informal meeting and scientific exhibition at 30, Russell Square, London. An excellent display of chemical and general scientific apparatus was given by well-known manufacturers. Electric ovens, balances, and microscopes, sterilisers, filters, water softeners, research chemicals, and general scientific glassware were prominent and the Scientific Glassblowing Co. proved the value of a "live" exhibit by sending an expert glass-blower whose efforts attracted considerable attention. Sections of coke in different stages formed an interesting exhibit by Woodall Duckham and Co., and the British Photographic Research Association showed a new Selenium Cell Density meter. Arthur Johnson, Ltd., showed "Chinagraph" pencils in four colours, for writing on glass, etc. Before the war this type of pencil was made almost exclusively in Germany.

Other firms exhibiting included C. Baker, W. Watson and Sons, Ltd., Sensible Heat Distillation, Ltd., British Drug Houses, Ltd., John J. Griffin and Son, Ltd., F. E. Becker and Co., A. Gallenkamp and Co., Ltd., Brown and Son, R. and J. Beck, Ltd., L. Oertling, Ltd., Evans, Adlard and Co., The Stream-Line Filter Co., United Water Softeners, Ltd., T. Tryer and Co., Ltd., H. K. Lewis and Co., Ltd., displayed an excellent circulating library of all the latest scientific literature, prominent among which were books published by Ernest Benn, Ltd. Of particular interest was the exhibition of a large collection of prints of famous chemists by Messrs. C. H. Cribb and R. B. Pilcher.

The meeting realised both its aims in that it offered considerable chemical interest and proved an excellent opportunity for social intercourse not possible in a formal meeting.

Society of Dyers and Colourists

Action of Aluminium Hydroxide on Dyestuffs

A MEETING of the Society of Dyers and Colourists (Manchester Section) was held on Friday, December 12, Mr. J. Huebner, M.Sc.Tech., F.I.C., presiding, and a paper entitled: "Recent Experiments on the behaviour of Aluminium Hydroxide towards Dyestuffs and Salts," by Messrs. J. K. Wood, D.Sc., F.I.C., and A. Wooller, M.Sc.Tech., was read by the first-named.

Mr. WOOD said that in previous communications to the Society he had shown, in conjunction with Mr. Morley and Mr. Collins, that the behaviour of titanic acid and of stannic acid towards dyestuffs was influenced by the mode of preparation of the compounds in question. This influence of the mode of preparation was attributed to the amphoteric character of the substances which made it possible for them to adsorb either acid or alkali from the solution in which they were being produced, so that, according to the condition of the solution, there was either acetate on one occasion or alkali on another, thus giving rise to products capable of taking up acid dyes or basic dyes respectively. It was thought that similar results might possibly be obtained with other substances of an amphoteric character; that it might be said an hydroxide like aluminium hydroxide could either have the adsorption of an alkali or the adsorption of an acid according to the condition of the solution in which it was being made, and that would lead to a difference, according to the mode of preparation, in behaviour towards dyestuffs. What were being dealt with in the paper were experiments carried on recently on the behaviour of what had been termed, for definite reason, hydrated aluminium oxide or hydrated alumina, upon account of the amount of water being variable and the fact that there was no very definite compound.

Experiments were described which showed the difficulty of preparing hydrated alumina free from impurity. In many cases, the behaviour of the product towards dyestuffs was influenced by the impurity present. Hydrated alumina had more affinity for acid than for basic dyes, and evidence was advanced by the writers of the paper which indicated that with the former class of dyes the process of fixation of the colour was one involving an exchange between the acidic impurity in the hydrated oxide and the acid of the dyestuff.

Alkali Cellulose

A second paper entitled: "On Alkali Cellulose," by Professor E. Knecht and J. H. Platt was read by Professor Knecht, who said that it was now more than 80 years since Mercer, when filtering a solution of caustic soda of 60° Tw. through a filter, composed of a six-fold layer of cambric, noticed that the filtrate had been reduced in strength to 53°. The experiment, which had been performed for a specific purpose, led unintentionally to the important discovery of what was now known as the mercerising process. In the course of his further investigations of his "soda-ised" cotton, or, as Dr. Gladstone called it, "soda'd" cotton, Mercer was led to conclude, from indirect evidence, that on treating cotton with caustic soda of 45° Tw., or thereabouts, a definite compound was formed, represented, according to the present way of writing it, as one of cellulose to one of caustic soda. Some years later, Dr. Gladstone, by immersing cotton in solutions of caustic soda and caustic potash, and then extracting the excess of caustic alkali by steeping in 90 per cent. alcohol, was able to show that the amount of alkali taken up was one-half of that assumed by Mercer, and definite compounds, represented by the formula of two of cellulose to one of caustic soda and two of cellulose to one of caustic potash, had been formed. Since that time, but more especially within the last 25 years, the question of the composition of alkali-cellulose occupied the attention of numerous investigators, some of whom had confirmed the views held by Mercer and by Gladstone, whereas others had maintained that the amount of alkali taken up by the cotton fibre was a variable quantity depending upon the constitution of the caustic alkali.

"Alkali Cellulose" was the product which resulted when cotton was subjected to the action of strong caustic soda or potash. Using gravimetric combined with volumetric methods the authors of the paper showed that beyond 40° Tw. the compound formed by caustic soda possessed a constant composition which corresponded to that obtained in another way by Dr. Gladstone. The same was found to hold good for caustic potash beyond a strength of 70° Tw.

Chemical Trade Returns for November

Imports and Exports Show an Increase on Last Year

THE total value of chemicals, dyes, drugs, and colours imported during November was £1,279,662, a decrease of £61,299 on last month's figures, but an increase of £143,422 on the figures for November, 1923. Exports in this class were valued at £2,171,003, an increase of £8,041 on last month's figures and an increase of £156,488 on the value for the corresponding period of 1923.

Imports for November

INCREASES.	1924.	1923.
Acid, acetic.....tons	701	630
Acid, tartaric.....cwt.	2,063	999
Bleaching materials ..... ,,	4,264	1,445
Calcium carbide ..... ,,	100,709	100,544
Nickel oxide ..... ,,	2,965	1,873
Sodium nitrate ..... ,,	122,482	110,629
Sodium compounds, except nitrate ,,	38,296	22,008
Cream of tartar ..... ,,	3,708	3,059
Zinc oxide .....tons	683	628
Intermediate coal tar products, including aniline oil and salt, and phenyl-glycine .....cwt.	68	10
Alizarine dyestuffs ..... ,,	5,740	222
Unspecified coal tar dyestuffs ..... ,,	6,931	2,444
Barytes, including blanc fixe ..... ,,	56,300	51,560
Potassium nitrate ..... ,,	122,482	110,629
Natural indigo ..... ,,	154	56
White lead ..... ,,	17,811	11,942
Essential oils, except turpentine ..lb.	386,234	310,040

DECREASES.	1924.	1923.
Borax.....cwt.	2,625	9,320
Red lead and orange lead..... ,,	2,544	2,992
Turpentine ..... ,,	27,279	39,097
Crude glycerin ..... ,,	46	1,139
Distilled glycerin ..... ,,	36	333
Potassium compounds (except nitrate) ..... ,,	484,967	508,137
Synthetic indigo..... ,,	—	21
Unspecified painters' materials .... ,,	64,430	66,122
Mercury .....lb.	40,080	131,298

Exports for November

INCREASES.	1924.	1923
Unspecified coal tar products .....cwt.	30,077	30,375
Distilled glycerin ..... ,,	28,294	12,045
Sodium chromate and bichromate . ,,	3,554	2,932
Sodium sulphate, including salt cake ,,	289,915	97,944
Barytes, including blanc fixe ..... ,,	1,156	280
Acid, sulphuric ..... ,,	2,516	1,515
Ammonium sulphate .....tons	26,188	19,005
Tar oil, creosote oil, etc. .....gal.	4,370,276	1,561,826
Crude glycerin .....cwt.	17,990	4,217
Unspecified potassium compounds ,,	3,014	2,065
White lead ..... ,,	17,822	14,604
Paints and enamels, prepared ..... ,,	29,229	27,604

DECREASES.	1924.	1923.
Copper sulphate .....tons	379	585
Potassium nitrate .....cwt.	787	1,165
Sodium carbonate, etc. ..... ,,	436,685	486,743
Caustic soda ..... ,,	130,535	149,972
Acid, tartaric ..... ,,	972	2,901
Ammonium chloride .....tons	287	479
Anthracene .....cwt.	—	248
Benzol and toluol.....gal.	1,053	214,830
Carbolic acid.....cwt.	7,402	10,848
Naphtha .....gal.	2,681	103,791
Naphthalene .....cwt.	1,505	18,281
Potassium chromate and bichromate cwt.	2,762	4,200
Unspecified sodium compounds .... ,,	42,527	48,911
Zinc oxide .....tons	182	273
Coal tar dyestuffs.....cwt.	9,641	12,915
Dyestuffs, other than coal tar .... ,,	8,225	8,521
Paints and colours, ground ..... ,,	29,107	30,372
Unspecified painters' materials .... ,,	45,745	55,298

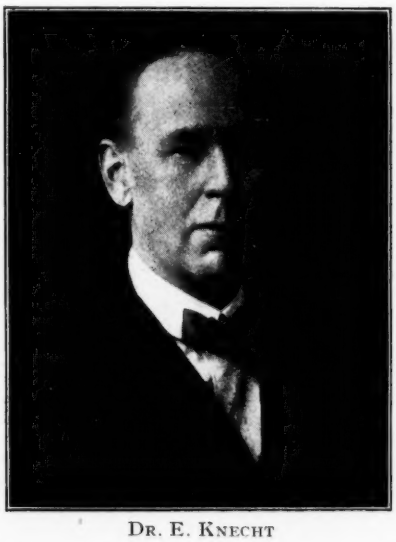
To Ensure Watertightness

A NATURAL asphalte rock aggregate, blended with refined Trinidad bitumen and tempered with a high flash-point proper-viscosity fluxing oil—these constitute the composition of Dickinson's "Seal" Branded Mastic Rock Asphalte, according to an illustrated pamphlet issued by John Dickinson and Co. (Bolton), Ltd., of Fairclough Street, Bolton. Its watertight qualities are confirmed by a maintenance guarantee.

Testimonial to Dr. E. Knecht

In a circular issued by the Society of Dyers and Colourists it is stated that, in view of the great service rendered by Professor Edmund Knecht, Ph.D. (Zürich), M.Sc.Tech.(Manch.), F.I.C., to the Society over a period of 42 years, for 40 of which he has been foreign editor of the *Journal*, it has been decided to present him with a testimonial. Any who desire to take part are invited to send their donations to the Secretary of the Society, 30, Pearl Assurance Buildings, Bradford.

In a note on the matter in the current issue, the *Journal* (which publishes an excellent photogravure reproduction of a portrait of Dr. Knecht) states that Professor Knecht is known personally to a large number of members of the Society, both at home and abroad, and, by reputation, to all throughout



Dr. E. Knecht

the world who are interested in colouring matters and the chemical aspects of the textile industries. He was born in Liverpool in 1861, and took his doctorate in Zürich. After acting as assistant to Professor Victor Meyer in Zürich for over a year, he was appointed in 1884 Head of the Department of Chemistry and Dyeing in the Bradford Technical College, an appointment subsequently held by each of his co-editors in succession. In 1900 he became Chief Lecturer in Chemistry and Dyeing, and in 1902 Professor of Tinctorial Chemistry in the Manchester College of Technology, and at present holds the position of Associate Professor of Applied Chemistry in the Manchester College of Technology and in the Manchester University.

When the Society of Dyers and Colourists was formed in 1884, Dr. Knecht was appointed editor of the *Journal* which it was decided to publish, and he has retained that position to the present time, acting as sole editor for the first ten years, then in association with Mr. Christopher Rawson from 1903 to 1909, and since the latter date with Professor W. M. Gardner.

Germany's Chemical Industry

According to an official Department of Overseas Trade report on trade conditions in Germany during November trade in fertilisers declined. As regards ceramic chemicals business improved, but sales to France ceased almost entirely after the coming into operation of the 26 per cent. Reparation Levy. Exports of incandescent gas light chemicals, which were formerly very considerable, especially to England and America, are practically stagnant as a result of the prohibitive duties levied by those countries. Sales to Occupied Territories has revived.

In the potash industry inland sales fell off, while foreign sales increased. The latter now amount to 90 per cent. of the total production. In the petroleum industry a decline in the yield of the bore holes is becoming more and more noticeable.

Chemical and Dyestuffs Traders

Opposition to Renewal of Safeguarding Act

A well-attended meeting of the British Chemical and Dyestuffs Traders' Association was held in Manchester on Friday, December 12, representatives of chemical and dyestuffs merchants from Lancashire, Yorkshire and the Midlands being present.

Mr. F. T. T. Reynolds, vice-chairman of the Association, who presided, referred to the continual changes in conditions under which merchanting business in chemicals and dyestuffs was carried on. The work of the Chemical and Dyestuffs Traders' Association, he said, was more essential to-day than ever in order that traders should get their dues. In the past they had failed to secure them and this failure could be traced almost entirely to the fact that there was a lack of organisation. Now that they had a sound, strong and thoroughly well-organised association representing chemical and dyestuffs traders it was only necessary for that organisation to be accorded the support it fully deserved and he could assure the meeting that their collective interests would be well looked after.

Mr. O. F. C. Bromfield, the secretary of the Association, gave a detailed account of the work during the past twelve months. Respecting legislation connected with "key" industries, a vast amount of work had been performed and it was entirely due to the efforts of the Association that a system of bonding of goods liable to the duty had recently been introduced. He regretted, however, the undue delay at the docks, which was still very bad. Discussing the possibilities of the reintroduction of Part II of the Safeguarding of Industries Act and its effect on the chemical trade, he stated that in August of next year Part I of the Act would expire and the Asssociation would be called upon to play a prominent part in countering any movement for its renewal. The Dyestuffs Act was dealt with and various steps which the Association had taken in connection with it explained. The position of reparation dyestuffs was now reaching a point when there would be drastic alterations. In regard to the 26 per cent. duty also some changes affecting chemical and dyestuffs traders' interests were to be expected at no distant date, and action had already been taken to ensure that the merchants' views were kept prominently before the Government. In addition to the work carried on in connection with Government departments the Association during the past year had kept in very close touch with other organised bodies representing commercial and industrial interests and, where necessary, had linked up with them in co-operative movements. Railway rates, shipping freights, dock charges and many other matters affecting traders had been part of the year's activities. The Association was giving evidence before the Balfour Committee on industry and trade and was also co-operating in a general movement to secure relief for agents of foreign firms who were at present liable to income tax payable by their principals. The success of the Association was reflected by its steady growth in membership, which now numbered nearly 140 firms.

Bitumen in Road Construction

Official support for the scheme for the foundation of a Chair of Highway Engineering at London University will probably be forthcoming from the Asphalt Roads Association, of which the majority of the leading members are already closely interested in the Paviors Company's proposals. The Asphalt Roads Association, of 40, Broadway, London, S.W.1, has as its primary function the development along scientific lines of the use of bitumen as a matrix in road construction. The research and technical work of the Association will be directed towards the evolution of new and improved methods of asphalt construction of various forms, and solution of practical problems that may arise; to the more effective regulation of bituminous road work by the formulation of improved standard and special specifications, and the simplification and co-ordination of sampling and testing methods; to the study of foundations and sub-bases, and of aggregates for use in asphalt; and to the comparative costs and values of different types of construction in relation to the conditions encountered on roads of all classes.

Electrolytic Bleaching Agents

DURING the last four years not much has been heard of electrolysers, but sodium hypochlorite, in addition to being valuable as an antiseptic, has many industrial uses, the most important being in connection with the textile industry, says the *Manchester Guardian Commercial*. It is generally recognised that sodium hypochlorite produced by the electrolysis of a solution of sodium chloride is a more active and satisfactory bleaching agent than ordinary bleaching powder, because it contains no lime, and its application does not give rise to objectionable deposits on or in the fibre. Penetration is more effective, a perfect white is obtained, and, as there is less acid in the subsequent souring processes, less washing is required. Linen can be bleached satisfactorily with sodium hypochlorite, and raw cotton, cops, and yarns can be satisfactorily dealt with. Material bleached with electrolytic sodium hypochlorite is uniformly white, the softness, spring and permeability are retained and the bleaching strength of the liquor is regular, which ensures that there is neither over nor under bleaching. In paper mills, sodium hypochlorite is used on a large scale for bleaching sulphite pulp.

The principle of the electrolyser is that, when a continuous electric current is passed through a solution of comomn salt in water, the salt solution is decomposed, hydrogen gas being given off at the negative electrode and sodium hypochlorite is formed, which remains in solution. One firm that has specialised in the manufacture of bleaching plant has been closely associated with the development of electrolysers for making bleaching solutions. In one make there is a forced circulation of brine through the electrolytic cells. For medium output the horizontal flow type is commonly used and for larger output the vertical flow type. At one time all electrolysers were made with platinum electrodes, but many are now with cheaper electrodes made of graphite.

Chemicals in Flour: Official Inquiry

THE Departmental Committee on the use of preservatives and colouring matters in food has begun an inquiry as to whether and to what extent the practice of treating flour with chemical substances is objectionable on grounds of health. The Committee will consider whether it is desirable in the interest of the public health that the practice should be prohibited or restricted, and in the latter case what restrictions should be imposed.

Bleaching flour is a comparatively modern innovation, and was introduced into this country about the beginning of the century to meet the public demand for white flour. Many substances have been tried in the process, including ozone, chlorine, oxides of chlorine, bromine, and nitrogen peroxide, but the last named is stated to be the agent chiefly used. Millers, bakers and doctors are at variance as to the effect of bleaching on flour. The obvious result is a change of colour, but investigators have submitted that more subtle alterations take place affecting the baking qualities. It is also contended that it improves the appearance of inferior flour and hides defects.

In the United States, flour bleached by any process is regarded as adulterated if the bleaching reduces the quality of the article or conceals any damage or inferiority, but bleaching is not entirely prohibited at present.

Cyanide Sales and Prices in 1924

COLONEL SIR EDWARD A. BROTHERTON, chairman of Brotherton and Co., Ltd., and recently elected chairman of the Cassel Cyanide Co., Ltd., in the place of the late Sir George Beilby, presided over a general meeting of the Cassel Cyanide Co. on Wednesday, December 10. The Chairman made reference to the death of Sir George Beilby, whose connection with the company extended over 32 years, during which he rendered incalculable service to the company and to the cyanide industry, as well as to science and education generally. In moving the adoption of the annual report, the Chairman said that the demand for cyanide during the year was fairly satisfactory and sales were well maintained in spite of active competition. Selling prices, however, suffered a further reduction and they could look for no stability in this direction until a lower level was reached, although their product was already selling at less than pre-war prices. The company had been working during the past year on new processes of manufacture with a view to lowering production costs. Patents had now been issued and published and covered quite a revolutionary process for the manufacture of metallic sodium, which was the base for the production of high-grade sodium cyanide. Their chief chemist, Dr. Ewan, was the inventor. The report was adopted.

The Scope and Limits of Synthetic Perfumes

M. PIERRE MORÉNA, one of the principal manufacturers of perfumes in the Grasse region, declares (our Paris correspondent states) that synthetic scents have not injured the local industry of natural perfumes as was feared. On the contrary the two industries are mutually helpful. The reasons for this are interestingly explained by a competent authority, M. Charabot. In the same way (he says) as a single note is powerless to constitute a melody, an isolated chemical substance cannot be a perfume. The latter is due to "a concert of several chemical individualities." The scent of a rose is the resultant of the odoriferous effluvia of a considerable number of these individuals admirably associated. With rare exceptions, then, and contrary to what takes place in the case of dyestuffs, the industry of artificial perfumes cannot aim at the synthesis of the natural product as the latter is not a chemical individual. On the other hand, the synthetic industry tends towards the creation of substances having odours as yet unknown and adding new notes to the perfumers' gamut. It seems capable of contributing a special characteristic to its productions.

U.S. Sulphuric Acid Production

THE U.S. Department of Commerce announces that fertiliser manufacturers during the first half of 1924 produced 797,174 tons of sulphuric acid and consumed 886,901 tons in the manufacture of 1,584,195 tons of acid phosphates containing 26,547,810 units (20 lb.) of available phosphoric acid. The production of sulphuric acid by fertiliser manufacturers was thus equal to 90 per cent. of their total consumption. Acid phosphates sold as such amounted to 1,310,678 tons, containing 21,555,342 units of available phosphoric acid; and 1,261,190 tons, containing 20,288,788 units, was consumed in the manufacture of other fertilisers. The statistics for the first half of 1924 as compared with the first half of 1923 show an increase of 15·3 per cent. in total sales of acid phosphates, together with decreases of 9·9 per cent. in production of acid phosphates, 4·5 per cent. in stock of sulphuric acid on hand at the end of the period and 13·1 per cent. in stock of acid phosphates.

Chemical Trade Wages

AN advance of one penny an hour for process and time workers, with an equivalent increase for piece-workers, to operate from January 1 next, was claimed at a meeting on Thursday, December 11, of the Joint Industrial Council for the Chemical Trades, over which Mr. Roscoe Brunner presided.

The case for the workers was put by Mr. W. T. Kelly, M.P., Mr. F. Eccles, and Mr. D. Bonham. Mr. R. Lloyd Roberts intimated for the employers that the advance could not be granted.

There was a discussion on the position of the chemical industry and allied trades, and the Council adjourned until January, when the discussion will be resumed.

An Anthracite Combine

THE Raven and Garnant collieries at Ammanford, South Wales, part of the Ashburnham group controlled by Sir Beddoe Rees, have been sold to a new company, the Raven Collieries, Ltd., for about half a million sterling. The purchaser is said to intend to group the anthracite properties as a rival to the existing combines, the Amalgamated Anthracite Collieries, controlled by Sir Alfred Mond, and the United, controlled by Mr. F. Szarvasy. His policy includes the acquisition of existing and the development of new collieries. Sir Beddoe Rees said the grouping policy was good. Canada could take half a million tons of anthracite yearly, and there was an increasing demand from Germany, Italy, France and Rumania. The future of the industry was bright.

From Week to Week

A POTASH SURVEY OF AUSTRALIA is to be undertaken by the Institute of Science and Industry.

"RAYON," in place of the two words "Artificial Silk," has now been officially adopted by the Silk Association of Great Britain.

FIRE caused by ignited turpentine damaged the premises of Owen Brothers, paint and distemper manufacturers, of Broad Street, Birmingham, last week.

A SUGAR FACTORY is to be erected at Littleport, near Ely. Further schemes are also under consideration for the erection of sugar factories in the Manchester district and at Kidderminster.

FIRE DESTROYED the oil refinery at the mills of T. Meredith, Roberts and Co., of Hull, on Monday. The refinery carried a heavy stock of oil and paint and explosions of barrels were frequent.

A FAVOURABLE CONDITION is revealed by the official figures of the United States chemical trade for October. The exports, amounting to $13,393,633, were the highest for any single month during the year, and were 14 per cent. above October of last year. The imports, on the other hand, with an aggregate value of $14,647,173, were 8 per cent. less than for October of last year.

MR. D'ARCY COOPER, vice-chairman of Lever Brothers, Ltd., has left England for the West Coast of Africa to join Lord Leverhulme, who is already in Lagos. They will together undertake a tour of 10,000 miles, visiting the Niger Company's properties in Nigeria, the Gold Coast Colony, Sierra Leone, French Senegal, and the British Gambia Colony. It is expected that they will return home about the end of March.

MARSHALL, SONS AND CO., LTD., engineers, Britannia Ironworks, Gainsborough, Lincolnshire, inform us that from January 1, 1925, they will be the sole British concessionnaries and manufacturers of the "Cummer" Asphalt Plants. The whole of the machinery will be constructed at Gainsborough, where a special department has been laid out and equipped for its manufacture. The firm is also placing on the market a new line of concrete mixers.

MR. S. P. SCHOTZ, D.Sc. Tech. (Zurich), B.Sc. (Honours, London), A.R.T.C. (Glasgow), F.I.C., who will be known to our readers by his work on the applications of colloid mills, his book on *Synthentic Organic Compounds*, and articles on related subjects in these columns, has opened a laboratory at 48, Newcomen Street, London, S.E.1 (Telephone: Hop 3690), where he will continue his technical researches into new manufactures and improvements to existing processes.

"THE INVENTION OF A GLASGOW CHEMIST" mentioned in our report of the Ramsay Chemical Dinner, refers, we are informed by the speaker, Councillor W. B. Smith, to the process of low temperature carbonisation of coal to produce smokeless fuel invented by Mr. Robert Maclaurin, who began his career with the Cassel Cyanide Co., under the late Sir George Beilby. This is a process which the Glasgow Corporation Gas Committee has adopted and are erecting in one of their gas works.

THE NATIONAL DRUG AND CHEMICAL UNION, through Mr. A. Gillian, general secretary, states that a draft agreement that has been reached by conferences of union representatives and principal employers in the chemical trade is now being submitted by the employers to all other firms who are members of the Drug and Fine Chemical Manufacturers' Association for acceptance by the full Association, and the members of the union affected are being balloted with a view to its endorsement and operation on and after January 1, 1925.

SO FAR THE TRADE AGREEMENT between Germany and this country does not affect the position of the German Reparation Levy. Importers will continue to be called upon to pay the 26 per cent. But there is fair reason (the British Chemical and Dyestuffs Traders' Association says) for stating that at some future date, after good notice has been given, the method of collection is likely to be altered so that the onus of payment will be lifted from the importer. Payment direct from Government to Government is, it is understood, the idea it is hoped to adopt. The date of this probable change has not been fixed, but, so far as it is possible to calculate at the moment, it may take place about February next.

A FILM of the United Alkali Works has been shown daily at Widnes this week.

SIR JOSEPH THOMSON has been elected an honorary member of the Institution of Civil Engineers.

SIR ALFRED AND LADY MOND leave for Egypt, Palestine, and the Near East in the first week of the new year.

MR. J. PORRITT, who has just died, was a partner in the firm of W. H. Birtwistle and Co., oil refiners, of Ramsbottom.

THE LONDON DEGREE OF D.Sc. (in chemistry) has been conferred on Mr. Harold Hunter, an internal student, of East London College and Battersea Polytechnic.

THE LIBRARY OF THE CHEMICAL SOCIETY will be closed for the Christmas holidays at 1 p.m. on Tuesday, December 23, and will re-open at 10 a.m. on Monday, December 29.

THE DEATH IS ANNOUNCED, at the age of 93, of Mr. H. J. Turner, head of the firm of Charles Turner and Son, Ltd., varnish and colour manufacturers, of Broad Street, Bloomsbury, London.

CAMBRIDGE UNIVERSITY announces that the prize of £30 from the Gordon Wigan income for Physics and Chemistry, for a research in chemistry, has been awarded to Ernest Henry Warren, B.A., of Jesus College, for an investigation on "The Configuration of the Ammonium Ion."

MR. FREDERICK MARLOW, B.Sc., was on Wednesday appointed Principal of the Wigan Mining and Technical College, in succession to Mr. S. C. Laws, M.A., M.Sc., who has accepted the post of Principal of the Northampton Polytechnic Institute, London. Mr. Marlow has been Principal of Blackburn Municipal Technical College for four years.

CARBON MONOXIDE POISONING was said to be the cause of the death of a boiler worker at Barrow Colliery, Worsborough, near Barnsley. The man, according to evidence at the inquest, which was adjourned, worked the boilers fed with gas from the coke plant. He complained of feeling dizzy, collapsed later, and died a few days afterwards.

COLUMBIA UNIVERSITY has just received three pieces of apparatus which were used previously by Louis Pasteur while he was Dean of the Faculty of Sciences at the University of Lille, from 1854 to 1857. They were sent by Professor Pascal, Dean of the School of Chemistry at that Univeristy. By direction of President Butler they have been transferred to the Chandler Chemical Museum, where they will be displayed as soon as a special case is ready for them.

MR. W. HULME LEVER, speaking in London at a luncheon in connection with the Labour Co-partnership Association, stated that Lever Brothers, Ltd., had 18,000 co-partners scattered all over the world and that the nominal value of the co-partnership certificates was about £2,000,000. Co-partnership, he said, created an atmosphere in which labour, capital, and management could all do their best with increased respect and for the joint benefit of all three.

AT THE GUILDHALL on Friday December 12, Messrs. Langston Jones and Samuel Smith, Ltd., of Compton Works, Weston Street, Bow Common, London, were summoned for having applied a false trade description—"white lead" to a mixture of sulphate of baryta and other substances, and for having sold such goods. The condition imposed on manufacturers is that no one is allowed to call as white lead or white-lead paint any substance which is not made principally from pure white lead. The prosecution which was undertaken by the White Lead Section of the London Chamber of Commerce, was however, withdrawn subject to certain arrangements between the parties.

A DEBENTURE HOLDER'S ACTION, brought by Sebastian Meyer against Oleine, Ltd., oil distillers and refiners, with registered offices at 4, Booth Street, Manchester, was heard at Manchester on Monday last by Mr. K. B. Lawrence, K.C. It was stated that the company was registered in March, 1921, with a capital of £50,000 in shares of £1 each, of which 38,812 shares had been issued. In addition, debentures to the amount of £15,000 had also been created, and the interest on these was two years in arrears. The trading of the company up to February 29 of this year had resulted in a loss of £32,278. The court was asked under these circumstances to appoint Mr. L. D. Kidson, chartered accountant, as receiver. The Vice-Chancellor made the order asked for.

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ELECTRO-CHEMISTRY.—The electro-chemical oxidation of benzene sulphonic acid, toluene-*o*-sulphonic acid and benzene-*p*-disulphonic acid. F. Fichter and E. Stocker. *Helv. Chim. Acta*, December 1, 1924, pp. 1064–1078.

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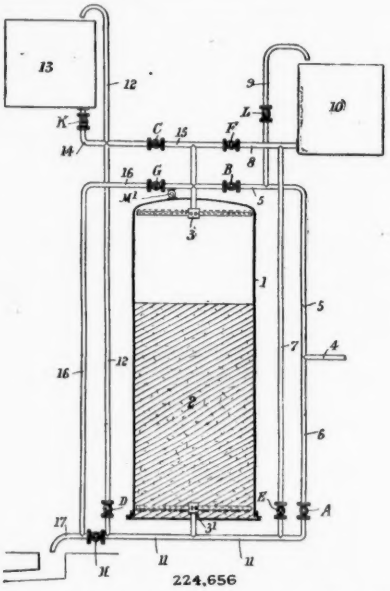
Patent Literature

Abstracts of Complete Specifications

224,568. Distillation or Treatment of Carbonaceous or Other Material and Recovery and Treatment of the Hydrocarbon Oils Contained Therein. P. M. Salerni, 1, Charing Cross, Trafalgar Square, London, W.C.2, and E. M. Salerni, 19, Rue Auber, Paris. Application dates, May 15 and December 20, 1923.

This apparatus is more particularly for the low or medium temperature distillation of carbonaceous material, and the object is to increase the surface exposed to the heating medium, to provide for expansion and contraction of the retort, to improve the arrangement of the retorts, and to economise space while allowing volatile constituents to be separately condensed. The material is subjected to a preliminary drying operation and is then distilled in a series of retorts arranged side by side in the same plane on opposite sides of a central passage way. There may be two or more series of superposed retorts, and the preliminary drying may be effected by storage in a compartment above the series of retorts. The heating surface of the retorts is corrugated to increase the surface area and to allow for contraction and expansion longitudinally. These corrugations are at right angles to the retort and an internal mixing or feeding device is provided having radial arms which extend into the corrugations. A special form of apparatus for cooling the coke is also described.

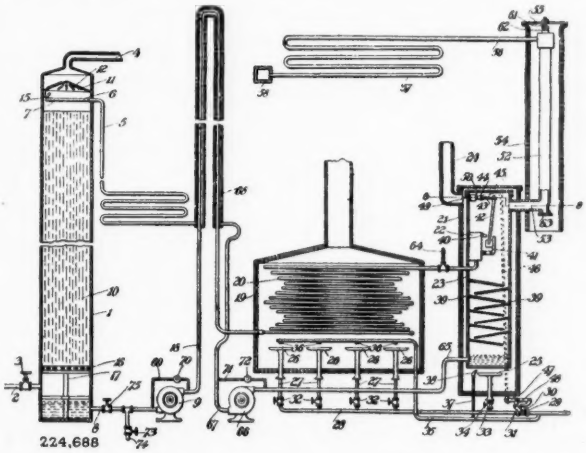
224,656. Purifying or Softening of Water by Means of Base-Exchanging Compounds and the Regeneration of such Compounds when Spent. T. P. Hilditch, Birchdene, Cross Lane, Grappenhall, Cheshire, H. J. Wheaton, 5, Walton New Road, Lower Walton, near Warrington, and J. Crosfield & Sons, Ltd., Warrington. Application date, September 24, 1923.



This apparatus is an improvement on that described in specifications Nos. 203,497 and 212,453 (see The Chemical Age, Vol. IX, p. 400 and Vol. X, p. 390) for the purification or softening of water by passing it through a base-exchanging compound. The vessel 1 contains a base-exchanging compound 2 and the water to be treated is supplied by the pipe 4. This pipe communicates by a pipe 5 and valve B with a distributor 3 and by pipes 5, 9 and valve L with a tank 10 which contains brine for regenerating the spent base-exchanging compound. The water may also be supplied through pipes 6, 11, and valve A to another distributor 3 at the bottom of the vessel 1, through the pipes 11, 12 and valve D to the tank 13 for treated water. Other connections are provided as illustrated. In operation all the valves are closed except A and C, if the water is to pass upwards through the base-exchanging compound, while if the water is to pass downwards the valves B and D are open and all the others are closed, so that the treated water is received in the tank 13. To regenerate the base-exchanging compound, the valves E and G are opened, and all the others closed so that brine passes from the tank 10 upwards through the material and then downwards to the outlet 17. The regeneration may be effected by downward flow by opening the valves F, H and closing the others. The subsequent washing of the material may be effected with untreated water by opening the valves A and G only, or with treated water by opening the valves K, D, and G only for upward flow, or by opening valves K, C, and H for downward flow. Several other modifications are also described.

224,688. Separating Gasolene from Natural Gas or Hydrocarbon Vapours, Method and Apparatus for. J. W. Chadwick, 517, Finance Building, Kansas City, Mo., U.S.A. Application date, October 18, 1923.

The apparatus is for absorbing hydrocarbon vapours of the gasolene group in a hydrocarbon solvent, and then distilling



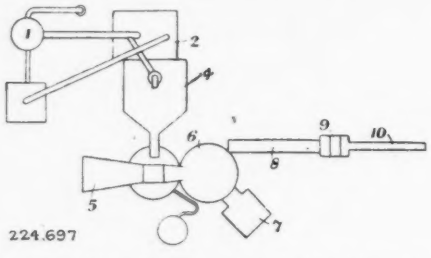
off the gasolene content from the solvent in a continuous cycle. The hydrocarbon vapour is supplied through an inlet 2, and passes upwards through a tower 1 in which it meets a shower of crude oil admitted through the pipe 5 and sprayed from a distributor 7. The oil absorbs the gasolene vapour, and passes through a pipe 8 to a pump 9, which delivers it through a pipe 18 to a pipe coil 20. The tower 1 contains a baffle 10 of expanded sheet metal, over which the oil and vapour flow. The upper end of the heating coil 20 extends into a casing 21 and discharges into a tank 22 contained within a larger vessel 23. The oil in the vessel 23 may be heated by a burner 25, and the heating coil 20 is heated by burners 26. The fuel supply pipe 28 is controlled by a regulating valve 30, and the burner 25 is controlled by a valve 34. The vessel 23 is provided with a series of baffles 39.

The oil collecting in the tank 32 is discharged into a vessel 41 having a bale 42 pivoted to a rocking arm 43 mounted on a spindle 44, to which is also secured a crank arm 45 which is connected through a rod 46 to the operating mechanism of the valve 30. When the vessel 41 becomes filled with oil it falls, and acting through the valve mechanism opens the valve 30. Fuel is thus admitted to the burners 26 to heat the coil 20. The more volatile constituents of the oil in the vessel 23 are thereby liberated and pass into a vertical condenser 52 arranged within a draught tube 54. Vapour passes from the upper end of the condenser 52 to another condenser 57 and receiver 58. The upper end of the condenser 52 is provided with a thermostat which operates a closing disc 55 to control the draught through the tube 54, and thereby the temperature of the condenser 52. A pipe 65 extends from the bottom of the vessel 23 to a pump 66, which delivers oil to a heat exchanger 68 which heats the cold oil delivered by the pump 9. The lighter vapours are liberated from the solvent oil in the vessel

23 and pass off to the condenser 57, while the solvent containing the heavier fractions is withdrawn from the vessel 23 by the pump 66, and returns through the heat exchanger 68 and pipe 5 to the top of the tower 1, so that it is again used for absorbing hydrocarbon vapour. The whole operation is automatic and controlled by the flow of the solvent, so that the system requires very little attention.

224,697. Dry and Commercial Neutral Sulphate of Ammonia, Apparatus for the Production of. S. Henshaw, S, Stonier, and Talk o' th' Hill Colliery, Ltd. Chatterley, Tunstall, Stoke-on-Trent. Application date, October 24, 1923.

In this apparatus the sulphate of ammonia is neutralised in a centrifugal separator by a spray of ammonia automatically conveyed to a hot air drier, and thence through crushing rollers.



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The illustration shows a plan view of the plant. Ammonia pssses from the still 1 to the saturator 2, and the resulting sulphate crystals are projected upwards through a pipe on to a draining table 4. The salt then passes to a centrifugal separator 5, where most of the liquid is removed. The acid sulphate is then washed with a dilute solution of ammonia applied in the atomised form by an air blast, and the liquid is again separated centrifugally. The moist neutral sulphate is automatically conveyed by a bucket elevator to the top of a cylindrical hot air drier 6, which is provided with horizontal shelves over which the salt is conveyed by rabbles. The drier 6 is heated by hot air from the furnace 7. The dried salt is then carried by an elevator 8 to crushing rollers 9 which discharge it into a shoot 10. The dry and neutral salt then passes to an automatic weighing and bagging device.

224,734. Centrifugal Liquid Separators. J. V. M. Risberg, Järnagatan 7, Södertälje, Sweden. Application date, December 4, 1923.

The object is to enable ball bearings to be used for the spindles of centrifugal separators and to protect them from the entrance of foreign matter and moisture. The separator is mounted on the upper end of the spindle, which is enlarged below the separator and made hollow to accommodate the ball bearings. A fixed stem passes upwards into the hollow shaft and carries one element of each set of ball bearings, the hollow shaft carrying the other element. The hollow shaft is contracted at its lower end so as to fit closely around the fixed stem, and carries a worm which engages with a driving worm wheel. The fixed central stem may be rigid or flexible, and in the former case the vibrations transmitted to this stem from the rotating bowl are absorbed by spring buffers at the lower end.

224,764.—Salts of the *p*-Oxy-*m*-Acylamino-Phenylarsinic Acids, Process for the Preparation of. G. B. Ellis, London. From Soc. Chimique des Usines du Rhône, 21, Rue Jean Goujon, Paris. Application date, January 22, 1924.

In the use of the *p*-oxy-*m*-acylamino-phenylarsinic acids obtained by treating amino-oxyphenylarsinic acid with the chloride or the anhydride of the fatty acid, it has been found that the solubility of their salts in water is small, and this a disadvantage in their use for therapeutic purposes. It has now been found that *p*-oxy-*m*-acylamino-phenylarsinic acids form well defined monobasic salts with alkyl amines, which give concentrated solutions in water which are very stable and have a strictly neutral reaction. These salts are obtained by mixing equi-molecular proportions of the alcoholic solutions of the free acid and the amine, and then evaporating the alcohol. Examples are given of the monobasic diethylammonium-*p*-oxy-*m*-acetylamino-phenylarsinate, and the monobasic monoethyl-ammonium-*p*-oxy-*m*-formylamino-phenylarsinate.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention: —200,816 (L. Lilienfeld), relating to the preparation of alkali celluloses and of cellulose ethers from them, see Vol. IX., p. 319; 200,827 (L. Lilienfeld), relating to the preparation of alkali cellulose of low water content, and of cellulose ethers from it, see Vol. IX., p. 319; 202,311 (Ricard, Allenet et Cie), relating to conversion of gaseous aliphatic ethylene hydrocarbons into other hydrocarbons, see Vol. IX., p. 431; 206,822 (L'Oxhydrique Française), relating to manufacture of hydrogen, see Vol. X., p. 73; 209,100 (C. Clerc and A. Nihoul), relating to complex ores containing zinc, see Vol. X., p. 250; 210,761 (Ricard, Allenet et Cie), relating to dehydration of alcohol, see Vol. X., p. 391; 213, 586 (H. Dupuy), relating to distillation of solids or liquids, see Vol. X., p. 602; 214,951 and 216,098 (Soc. Chimique des Usines du Rhône), relating to manufacture of calcium arsenate and other arsenates of the alkaline earth metals, see Vol. XI., pp. 16 and 101; 216,129 (E. Schmidt and Ges. für Chemische Produktion), relating to obtaining hydrochloric acid free from arsenic, see Vol. XI., p. 102; 219,287 (Chemische Fabrik Griesheim Elektron and A. Beielstein), relating to recovery of metal from scrap, see Vol. XI., p. 299.

International Specifications not yet Accepted

223,190. Aralkyl and Acyl Resorcinols. Sharp and Dohme, Inc., Baltimore, Md., U.S.A. (Assignees of A. R. L. Dohme, 307, West Pratt Street, Baltimore, Md., U.S.A.) International Convention date, October 9, 1924.

Resorcinol and an aromatic acid are heated with a condensing agent such as zinc chloride, and the acyl resorcinol is purified and reduced by zinc amalgam and hydrochloric acid. In an example, benzoyl resorcinol is first produced and purified by passing carbon dioxide into a sodium carbonate solution of the reaction mixture, and recrystallising the precipitated oil from benzene. The benzoyl resorcinol is reduced to benzyl resorcinol. These products are non-toxic antiseptics.

223,192. Synthetic Drugs. G. Lockemann, 126, Konigsweg, Grunewald, Berlin. (Assignees of W. Neumann, 1, Beusselstrasse, Berlin, and H. Kügler, 80, Schlachthofstrasse, Glauchau, Saxony, Germany.) International Convention date, October 11, 1923. (Addition to 214,261.)

Specification 214,261 describes a method of reducing 1-phenyl-2: 3-dimethyl-4-nitroso-5 pyrazolone in the presence of formaldehyde or its polymers to obtain 1-phenyl-2: 3-dimethyl-4-dimethyl-amino-5-pyrazolone. In the present invention a solution of 1-phenyl-2: 3-dimethyl-5-pyrazolone in dilute sulphuric acid is treated with sodium nitrite and the product reduced with zinc dust and sulphuric acid. Formaldehyde and a further quantity of reducing agent are added and the mixture filtered and made alkaline. The dimethyl-amino-pyrazolone is extracted with benzene.

223,221. Synthetic Drugs. J. D. Riedel Akt.-Ges., 1, Riedelstrasse, Britz, Berlin. International Convention date, October 10, 1923.

To obtain C: C-disubstituted barbituric acids which contain a β- or γ-bromallyl group together with another β- or γ-bromallyl group or an alkyl, aryl or alicyclic group, these groups are introduced into barbituric acid. The β-bromallyl group is introduced by 1: 2-dibromo-2: 3-propylene, or 1: 2: 3-tribromopropane, and hydrogen bromide then split off with alkali. Examples are given of the preparation of β-bromallyl-ispropylbarbituric acid and di-(β-bromallyl)-barbituric acid.

223,543. Electrical Treatment of Gases. Soc. Anon. le Petrole Synthetique, 16, Avenue de l'Opéra, Paris. (Assignees of C. H. Andry, 20, Rue Lesueur, Paris.) International Convention date, October 19, 1923.

Various products are obtained by treating gases or mixtures of gases by electric arcs, sparks, or silent discharges. Water gas when so treated yields methane, carbon dioxide, and water vapour. The carbon dioxide and water vapour are removed, and the carbon dioxide returned to the gas producer to be converted into monoxide. Methane when treated either alone or with carbon monoxide yields acetylene and hydrogen or

water vapour. If methane is treated with carbon monoxide and hydrogen, ethane and water vapour are obtained. Acetylene yields benzol when treated alone, or ethylene and ethane when treated with hydrogen. Methane, acetylene or benzene may be converted into various members of the paraffin, ethylene or benzene series by mixing with carbon monoxide and hydrogen and subjecting to electric treatment. In an example, water gas may be passed at 250° C. over a catalyst obtained by the action of acetylene on iron, nickel, or manganese, yielding methane which is subjected to electric treatment yielding acetylene. The acetylene is passed over the same catalyst, yielding liquid and gaseous hydrocarbons. Purifiers or condensers are interposed between the successive reaction chambers.

223,244. Zirconium, Titanium, Niobium, Vanadium and Boron Compounds. Naamlooze Vennootschap Philip's Gloeilampen-fabrieken, 6, Emmasingel, Eindhoven, Holland. International Convention date, October 11, 1923.

This invention is primarily for depositing various compounds on wires or rods to make filaments for thermionic valves and the like, but the compounds may be removed from the wire or rod. The wire is heated in an atmosphere containing a volatile halogenide of the positive element and a gas containing the negative element of the compound, with or without hydrogen, a hydrocarbon, or carbon monoxide. In this manner may be obtained nitrides of zirconium, titanium, niobium, vanadium, and boron, phosphide of zirconium, carbides of tantalum and molybdenum, and also borides, silicides, selenides, carbo-nitrides and oxides. The wire, of platinum or the like, is heated electrically to 1000°–2000° C., and hydrogen, purified by cooling with liquid air, is passed through the volatile halogenide and then into the reaction apparatus. In the production of nitrides, the reacting gas contains nitrogen, and in the case of phosphides it contains phosphorus trichloride. Tantalum carbide is obtained from tantalum pentachloride and hexachlorethane or a mixture of carbon monoxide and hydrogen, molybdenum carbide from molybdenum pentachloride and carbon tetrachloride, tin oxide from air and tin chloride, and a carbo-nitride from cyanogen and halogenides.

Latest Notifications.

225,821. Process for the catalytic combustion of ammonia-oxygen mixtures. Cederberg, Dr. I. W. December 4, 1923.

225,824. Process for the preparation of dihydrocodeinone from thebaine. Knoll and Co. (firm of). December 7, 1923.

225,842. Treatment of ores and metallurgical products. Johannsen, F. December 7, 1923.

225,862. Manufacture of new monoazo dyes. Farbenfabriken vorm. F. Bayer and Co. December 5, 1923.

Specifications Accepted with Date of Application

198,373. Liquids, Treatment of. J. N. A. Sauer. May 26, 1922.

204,067. Retort furnaces for treating bituminous materials. S. V. Bergh. September 18, 1923.

207,555. Titanic and zinc compounds, Manufacture of. P. Pipereaut and A. Helbronner. November 25, 1922.

217,546. Nitric acid from weak nitric acid liquors, Process of recovering. Deutsche Celluloid Fabrik. June 15, 1923.

218,266. Extracting krypton and xenon from the atmosphere. Soc. Anon. d'Eclairage et d'Applications Electriques. June 29, 1923.

225,262. Insecticides and the like and their manufacture. British Dyestuffs Corporation, Ltd., and V. Lefebure. August 2, 1923.

225,263. Nitric acid, Process for obtaining. C. G. Redfern. (*J. Pintsch Akt.-Ges.*). August 18, 1923.

225,295. Metal oxides, Process of and apparatus for the reduction of—with continuous regeneration of the reducing gas employed. C. Constant and A. Bruzac. August 30, 1923. Addition to 202,970.

225,337. Furnaces for distillation and carbonization. F. Duplan. October 16, 1923.

225,369. Pure carbazol, Process of manufacturing. L. Weil and Chemische Fabrik in Billwarder vorm. Hell and Sthamer Akt.-Ges. November 20, 1923.

225,393. Soda crystals, Production of. H. L. Kidd. December 17, 1923.

225,396. Centrifugal separator. F. W. McEntire. December 18, 1923.

225,458. Electric arc furnaces. Soc. d'Etude et de Constructions Metallurgiques. December 17, 1923.

225,478. Ignition hood for sintering pans. J. E. Greenawalt. June 26, 1924.

Applications for Patents

Armstrong, J. J. V., and Naamlooze Vennootschap A. Jurgens' Margarinefabrieken. Process for distilling fatty acids, etc., from oils, etc. 29,619. December 10.

British Celanese, Ltd., Dickie, W. A., and Rooney, J. H. Manufacture of products having basis of cullulose derivatives. 29,720. December 10.

Cox, K., and McDermott, P. J. Refining of oils etc. 30,030. December 13.

Cross, C. F., and Engelstad, A. Manufacture of lignone derivatives. 29,731. December 10.

Farbwerke vorm. Meister, Lucius, and Brüning and Imray, O. Y. Manufacture of dyestuffs, etc. 29,558. December 9.

Farbwerke vorm. Meister, Lucius, and Brüning. Manufacture of complex gold compounds. 29,459. December 8. (Germany, June 2.)

Foamite Firefoam, Ltd. Hand fire extincteurs. 29,682. 29,683. December 10.

Heyl, G. V. Manufacture of barium-azo pulp or dry lakes. 29,698. December 10.

Kane, T., Strange and Graham Ltd., and Synthetic Products Co., Ltd. Production of acetone, etc. 29,678. 29,679. December 10.

Merck, E., and Skipsey, A. Preparation of homogeneous oleaginous bismuth preparations. 30,036. December 13. (Germany, December 13, 1923.)

Peachey, S. J. Vulcanisation of rubber. 29,501. December 9.

Plinatus, V. Manufacture of varnishes. 29,567. December 9.

Plinatus, V. Explosives. 29,713. December 10.

Späth, C. Extraction of nitrogen compounds from the air. 29,714. December 10.

Synthetic Ammonia and Nitrates, Ltd. Treating synthesis gases of synthetic ammonia plants. 29,978. December 13. (United States, December 13, 1923.)

Synthetic Ammonia and Nitrates, Ltd. Means for utilising energy of liquids under pressure containing gases. 29,979. December 13. (United States, December 17, 1923.)

Properties of Acetate Silk

Professor Antonio Sansone, writing in the *Manchester Guardian Commercial*, says :—

"Acetate silk has certain distinct and useful properties not possessed by any other art silk—among them its waterproof and uninflammable qualities—but if it is to have a large consumption means must be found to reduce its present high cost of production. This is quite possible chemically, and there are two ways of doing it : the one by recovering the acetic acid and the zinc chloride used in the manufacture of acetate cellulose silk, the other by using a cheaper source of cellulose than cotton or cotton waste, or even wood pulp. This should also be possible, as there are in almost every country numerous products which, if suitably treated, would yield cellulose, and experiments on a big scale have already been carried out.

"The subject of the treatment of acetate silk before dyeing is of paramount interest. A good many of the processes are apt to deprive the silk of its impermeability, to weaken it, and impair its lustre. In a general way, any process which deprives the acetate silk of its most important property of impermeability will not be a success. So far most chemists who experimented on the dyeing of acetate silk have hardly considered the great importance of its waterproof properties. The point requires a little elucidation. Acetate silk is waterproof, and consequently should be considered and treated more as a reserve than as a material to be dyed. Since the question of two and three colour processes is becoming of such importance in Lancashire, attention should be paid to a process whereby acetate cellulose might act either as a white or a coloured reserve.

"The difficulties experienced in the dyeing of acetate silk suggested to me the dyeing of the solution previous to its coagulation into silk, and, later on, the addition of dyestuffs to the acetate of cellulose. This method is practical but expensive, unless the acetic acid and the zinc used in the process are recovered. Acetate cellulose solution would take all basic colours with the exception of black, which might offer certain difficulties. Colours used in this way are fast to washing. By a modification of the process colours could also be printed on the solution or applied by other means to form coloured reserves."

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing those firms' independent and impartial opinions.

London, December 18, 1924.

IN spite of the imminence of the holidays and the stocktaking period, trade has continued quite active. Prices for the majority of Continental products still continue to rule firm and in a number of cases advances are not unlikely. Consumers are attracted by the favourable prices now offering and are contracting ahead. The export market is noticeable for the larger volume of inquiries coming to hand and for some products a fair amount of business has been put through for this account.

General Chemicals

ACETONE continues in good request and price shows no change.

ACID ACETIC.—A steady demand has been experienced and in some quarters a firmer tendency is noted. 80% Technical is still quoted at £41 to £42 per ton, with 80% Pure at £43 to £44.

ACID CITRIC is receiving more inquiry and price is unchanged at about 1s. 3d.

ACID FORMIC is steady with demand fairly satisfactory and price keeps at £52 to £53, ex wharf duty paid.

ACID LACTIC continues in fair demand with price steady at £43 per ton for 50% by weight duty paid.

ACID OXALIC is much firmer and buyers are contracting ahead at the favourable prices now ruling. An advance on spot prices is not unlikely.

ACID TARTARIC remains in poor demand, although the price is firmly held at about 11¾d.

ALUMINA SULPHATE has been in active request, with price firmer at £7 5s. to £7 10s.

ARSENIC.—A shade firmer with demand slightly on the increase. Prices so far, however, without change.

BARIUM CHLORIDE continues in active request and a large amount of business has been put through at round about £12 per ton. A firmer tendency is noted for forward delivery.

COPPER SULPHATE.—Price shows no change and the demand continues steady.

CREAM OF TARTAR has been in good request and the firmer tendency noted in our last report has continued, prices ranging from £82 5s. to £82 15s. per ton.

FORMALDEHYDE.—Demand very poor although price shows no further decline. Spot supplies available at £49 to £50 per ton.

EPSOM SALTS in better supply and price slightly easier at £4 15s.

LEAD ACETATE continues in keen demand, price firm at £47 to £48 with brown in less demand at round about £44 per ton.

LEAD NITRATE in steady demand, price without change from £43 10s. to £44.

LIME ACETATE remains unchanged at round about £14 per ton.

METHYL ALCOHOL.—In little demand, price easier at round about £52 per ton.

POTASSIUM CARBONATE AND CAUSTIC.—Both show a firmer tendency though demand is only small.

POTASSIUM PERMANGANATE.—After being easier has again firmed owing to higher prices being demanded for forward delivery from the continent.

POTASSIUM PRUSSIATE is exceedingly firm with very little spot supplies available and makers sold well ahead. Price 7¾d. to 8d. per lb.

SODA ACETATE has been in fair demand and price keeps steady at £23 10s. to £24 per ton.

SODIUM BICHROMATE.—A large number of contracts have been booked for forward delivery at English makers' reduced prices for 1925.

SODIUM HYPOSULPHITE.—Commercial quality is in steady demand with some works sold for the next 2-3 months. Price keeps steady at £9 10s. to £9 15s.

NITRITE OF SODA is in better request and a fair amount of business has been put through on the basis of £24 10s. per ton.

SODIUM PRUSSIATE is again firmer with producers sold out for months ahead. Quotations to-day between 4¼d. to 4½d. per lb.

SODIUM SULPHIDE.—This product keeps in buyers' favour with continental manufacturers competing for any large order passing. Demand, however, is only small.

Coal Tar Products

There is little change to report in the market for coal tar products since last week, the market maintaining a firm tone.

90% BENZOL is very scarce at 1s. 8½d. per gallon, on rails.

PURE BENZOL remains unchanged at 2s. per gallon on rails.

CREOSOTE OIL is rather firmer at 5¾d. to 6d. per gallon on rails in the North, and the price in London is 6¼d. per gallon.

CRESYLIC ACID is quiet at 1s. 11d. to 2s. per gallon on rails for the pale quality 97/99%, while the dark quality 95/97% remains at 1s. 7d. to 1s. 8d. per gallon on rails.

SOLVENT NAPHTHA remains firm at 1s. 4d. per gallon on rails.

HEAVY NAPHTHA has undergone no change, and is offered at 1s. to 1s. 1d. per gallon on rails.

NAPHTHALENES remain unchanged, the drained qualities being worth from £4 to £4 10s. per ton. 76/78 quality is offered at £6 to £6 10s. per ton, and 74/76 at £5 10s. to £6 per ton.

PITCH is quiet and buyers abroad show little interest either in prompt or forward. Prices, however, remain practically unchanged at 52s. 6d. to 55s.—f.o.b. London, 50s. to 52s. 6d. f.o.b. East and West Coast ports.

Nitrogen Products Market

Export.—During the last week there has been considerable demand for sulphate of ammonia from the Far East and substantial sales have been made. As a consequence the statistical position of the producers has been strengthened and if this demand continues there is every likelihood of a firmer market. Up to the present, prices remain unchanged at £13 15s., f.o.b. for prompt delivery and £14 to £14 10s. per ton, f.o.b. forward delivery.

Home Trade.—Since the announcement of the prices for the spring season there has been increased demand, especially for early delivery. Heavy bookings have also been made for February/April. Reports from various parts of the country point to an increase on last year's demand of about 10 per cent. The producers are reserving additional quantities in order to supply home requirements.

Nitrate of Soda.—The nitrate of soda market continues to be quiet and most of the business transacted has been for resale. The statistical position of the Producers' Association is weaker than it was two months ago. This is largely due to the European consumption not being up to estimate. However, it seems likely that the present schedule of prices will be maintained and that the producers will carry over unsold stocks.

American Market Movements

(FROM *Drug and Chemical Markets.*)

SLIGHT slackening in demand for industrial chemicals. Potassium carbonate prices advanced. Prussiates firmer. Arsenic slightly firmer abroad. Carbon tetrachloride stronger. Market continues generally firm. Demand for dyes and intermediates continues to improve. Pyridine is lower. Strong undertone in aniline oil. Naphthalene firmer. Benzene continues firm. Diethylaniline price unsettled. Other prices remain unchanged. Linseed oil prices lower on spot, due to lack of demand. Fish oils continue firm under active demand and scarcity. Animal oils moving in greater volume at recently advanced prices. Vegetable oils remain close to recent levels. Tallow reaches new high level. Turpentine is lower.

Fine chemicals show little change. Mercury is firmer. Menthol is lower. Potash permanganate is steady. Imported bromides closely held. Diethylbarbituric acid duty has been changed and is now effective. Codliver oil is active. Essential oils have gained sharply. Oil peppermint is still advancing. Messina essences are higher. Oils caraway and wormseed only weak items. Oil anise tending higher.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at sellers' works.

General Heavy Chemicals

Acid Acetic 40% Tech.—£21 10s. per ton.
Acid Boric, Commercial.—Crystal, £45 per ton. Powder, £47 per ton
Acid Hydrochloric.—3s. 6d. to 6s. per carboy d/d., according to purity, strength and locality.
Acid Nitric 80° Tw.—£21 10s. to £27 per ton, makers' works according to district and quality.
Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 65s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.
Bleaching Powder.—Spot, £11 d/d. Contract, £10 d/d. 4 ton lots
Bisulphite of Lime.—£7 10s. per ton, packages extra.
Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
Calcium Chloride (Solid).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carriage paid.
Copper Sulphate.—£25 per ton.
Methylated Spirit 64 O.P.—Industrial, 2s. 7d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.
Nickel Sulphate.—£38 per ton d/d. Normal business.
Nickel Ammonia Sulphate.—£38 per ton d/d. Normal business.
Potash Caustic.—£30 to £33 per ton.
Potassium Bichromate.—5½d. per lb.
Potassium Chlorate.—3d. to 4d. per lb.
Salammoniac.—£32 per ton d/d.
Salt Cake.—£3 10s. per ton d/d.
Soda Caustic, Solid.—Spot lots delivered, £16 7s. 6d. to £19 7s. 6d. per ton, according to strength; 20s. less for contracts.
Soda Crystals.—£5 to £5 5s. per ton ex railway depots or ports.
Sodium Acetate 97/98%.—£24 per ton.
Sodium Bicarbonate.—£10 10s. per ton carr. paid.
Sodium Bichromate.—4½d. per lb.
Sodium Bisulphite Powder 60/62%.—£17 to £18 per ton, according to quantity, f.o.b., 1-cwt. iron drums included.
Sodium Chlorate.—3d. per lb.
Sodium Nitrate refined 96%.—£13 10s. to £13 15s. per ton, ex Liverpool. Nominal.
Sodium Nitrite 100% basis.—£27 per ton d/d.
Sodium Sulphide conc. 60/65.—About £15 per ton d/d.
Sodium Sulphide Crystals.—£9 5s. per ton d/d.
Sodium Sulphite, Pea Crystals.—£15 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

Acid Carbolic Crystals.—5½ per lb. Quiet. Crude 60's, 1s. 7d. to 1s. 9d. per gall. Market quiet.
Acid Cresylic 97/99.—1s. 11d. to 2s. 1d. per gall. Fair business. Pale 95%, 1s. 8d. to 1s. 11d. per gall. Dark, 1s. 7d. to 1s 9d. per gall. Market dull.
Anthracene Paste 40%.—4d. per unit per cwt. Nominal price. No business.
Anthracene Oil, Strained.—6½d. to 7½d. per gall. Small demand. Unstrained, 6d. to 6½d. per gall.
Benzol.—Crude 65's.—9d. to 11½d. per gall., ex works in tank wagons. Standard Motor, 1s. 4½d. to 1s. 6d. per gall., ex works in tank wagons. Pure, 1s. 9½d. to 1s. 11d. per gall., ex works in tank wagons. Prices advanced. Supplies very scarce.
Toluol.—90%, 1s. 5½d. to 1s. 7d. per gall. More inquiry. Pure, 1s. 7½d. to 1s. 9d. per gall. Steady demand.
Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.
Creosote.—Cresylic, 20/24%, 8d. to 8½d. per gall. Not much business. Middle Oil, Heavy, Standard specification, 5¼d. to 6½d. per gall., according to quality and district. Market firmer. Steady demand.
Naphtha.—Crude, 8d. to 9d. per gall. Solvent 90/160, 1s. 3d. to 1s. 6d. per gall. Demand good. Higher prices probable. Solvent 90/190, 1s to 1s. 1d. per gall. Few inquiries
Naphthalene Crude.—Demand rather better. Cheaper in Yorkshire than in Lancashire. Drained Creosote Salts, £3 to £5 per ton. Steady, but quiet. Whizzed or hot pressed, £6 to £9 per ton. No business.
Naphthalene.—Crystals and Flaked, £12 to £15 per ton, according to districts.
Pitch.—Medium soft, 50s. to 60s. per ton, according to district. Plenty of inquiry for prompt and forward. Market very steady.
Pyridine.—90/160, 18s. 6d. to 19s. per gall. Rather flat. Heavy, 11s. 6d. to 12s. Steady.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.
Acid H.—3s. 10d. per lb. 100% basis d/d.
Acid Naphthionic.—2s. 2d. per lb. 100% basis d/d
Acid Neville and Winther.—5s. 8d. per lb. 100% basis d/d.
Acid Salicylic, technical.—1s. 1d. per lb. Good demand.
Acid Sulphanilic.—9d. per lb. 100% basis d/d.
Aluminium Chloride, anhydrous.—10d. per lb. d/d.
Aniline Oil.—8d. per lb. naked at works.
Aniline Salts.—8d. per lb. naked at works.
Antimony Pentachloride.—1s. per lb. d/d.
Benzidine Base.—3s. 9d. per lb. 100% basis d/d.
Benzyl Chloride 95%.—1s. 1d. per lb.
p-Chlorphenol.—4s. 3d. per lb. d/d.
p-Chloraniline.—3s. per lb. 100% basis.
o-Cresol 29/31° C.—3½d. to 4½d. per lb. Easier.
m-Cresol 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
p-Cresol 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate
Dichloraniline.—2s. 3d. per lb.
Dichloraniline S. Acid.—2s. 3d. per lb. 100% basis.
p-Dichlorbenzol.—£85 per ton.
Diethylaniline.—4s. 3d. per lb. d/d., packages extra, returnable.
Dimethylaniline.—2s. 2½d. per lb. d/d. Drums extra.
Dinitrobenzene.—9d. per lb. naked at works.
Dinitrochlorbenzol.—£84 10s. per ton d/d.
Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works 66/68° C. 1s. 2d. per lb. naked at works
Diphenylaniline.—2s. 10d. per lb. d/d.
G. Salt.—2s. 2d. per lb. 100% basis d/d.
Monochlorbenzol.—£63 per ton.
a-Naphthol.—2s. 4d. per lb. d/d.
B-Naphthol.—1s. per lb. d/d.
a-Naphthylamine.—1s. 3½d. per lb. d/d.
B-Naphthylamine.—4s. per lb. d/d.
m-Nitraniline.—4s. 2½d. per lb. d/d.
p-Nitraniline.—2s. 2½d. per lb. d/d.
Nitrobenzene.—5½d. to 5¾d. per lb. naked at works
o-Nitrochlorbenzol.—2s. 3d. per lb. 100% basis d/d.
Nitronapthalene.—10d. per lb. d/d.
p-Nitrophenol.—1s. 9d. per lb. 100 % basis d/d.
p-Nitro-*o*-amido-phenol.—4s. 6d. per lb. 100% basis.
m-Phenylene Diamine.—4s. per lb. d/d.
p-Phenylene Diamine.—10s. per lb. 100% basis d/d.
R. Salt.—2s. 4d. per lb. 100% basis d/d.
Sodium Naphthionate.—2s. 2d. per lb. 100% basis d/d.
o-Toluidine.—10d. per lb.
p-Toluidine.—2s. 10d. per lb. naked at works.
m-Toluylene Diamine.—4s. per lb. d/d.

Wood Distillation Products

There is a general feeling that the fall in price of acetates during the last few weeks has reached its limit. The tendency is now to stiffen again.

Acetate of Lime.—Brown £11 5s. per ton d/d. and upward. Grey, £14 10s. to £15 10s. per ton. Firmer. Liquor, 9d. per gall. 32° Tw.
Charcoal.—£7 5s. to £9 per ton, according to grade and locality. Demand better in many localities.
Iron Liquor.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.
Red Liquor.—10d. to 1s. per gall. 14/15° Tw.
Wood Creosote.—2s. 9d. per gall. Unrefined.
Wood Naphtha, Miscible.—4s. 9d. per gall. 60% O.P. Solvent, 5s. to 5s. 3d. per gall. 40% O.P. Firmer.
Wood Tar.—£4 10s. to £5 10s. per ton. Demand slack and stocks being held.
Brown Sugar of Lead.—£42 per ton. Steady market.

Rubber Chemicals

Antimony Sulphide.—Golden, 6½d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.
Arsenic Sulphide, Yellow.—1s. 11d. per lb.
Barytes.—£3 10s. to £6 15s. per ton, according to quality.
Cadmium Sulphide.—3s. 9d. to 4s. per lb., according to quantity.
Carbon Bisulphide.—£30 to £33 per ton, according to quantity.
Carbon Black.—7d. to 7½d. per lb., ex-wharf.
Carbon Tetrachloride.—£60 to £65 per ton, according to quantity, drums extra.
Chromium Oxide, Green.—1s. 3d. per lb.
Indiarubber Substitutes, White and Dark.—5d. to 9½d. per lb. Demand very brisk. Prices likely to remain steady owing to firmness of rapeseed oils.
Lamp Black.—£48 per ton, barrels free.
Lead Hyposulphite.—7½d. per lb.
Lithopone, 30%.—£22 10s. per ton.
Mineral Rubber "Rubpron."—£16 5s. per ton f.o.r. London

Sulphur.—£10 to £12 per ton, according to quality.
Sulphur Chloride.—4d. per lb., carboys extra.
Sulphur Precip. B.P.—£50 to £65 per ton.
Thiocarbanilide.—2s. 6d. per lb.
Vermilion, Pale or Deep.—5s. 1d. per lb. Dearer.
Zinc Sulphide.—7½d. to 1s. 8d. per lb., according to quality

Pharmaceutical and Photographic Chemicals

Acid, Acetic 80% B.P.—£45 per ton ex wharf London in glass containers.
Acid, Acetyl Salicylic.—3s 1d. to 3s. 3d. per lb., according to quantity. Sales steady. Price firm.
Acid, Benzoic B.P.—2s. 6d. per lb.
Acid, Boric B.P.—Crystal £51 per ton, Powder £55 per ton. Carriage paid any station in Great Britain.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 4½d. to 1s. 5d. per lb., less 5% for ton lots. Increased demand.
Acid, Gallic.—2s. 9d. per lb. for pure crystal, in cwt. lots. Easier.
Acid, Pyrogallic, Crystals.—7s. per lb. for 1 cwt. lots. Resublimed quality 8s per lb. Market firm.
Acid, Salicylic.—1s. 6d. to 1s. 8d. per lb., according to quantity.
Acid, Tannic B.P.—2s. 10d. per lb. Quiet steady demand.
Acid, Tartaric.—1s. 1d. per lb., less 5%.
Amidol.—9s. per lb. d/d.
Acetanilide.—1s. 10d. to 2s. per lb. More inquiry.
Amidopyrin.—14s. 6d. per lb. for spot stocks.
Ammonium Benzoate.—3s.3d.to 3s.9d. per lb., according to quantity.
Ammonium Carbonate B.P.—£37 per ton.
Atropine Sulphate.—12s. 6d. per oz. for English make.
Barbitone.—13s. 9d. per lb. Slightly lower. Quiet steady demand.
Benzonaphthol.—5s. 3d. per lb. spot.
Bismuth Salts.—Prices reduced by about 1s. 3d. to 2s. 3d. per lb. on account of the fall in the price of the metal.
Bismuth Carbonate.—8s. 6d. to 10s. 6d. per lb.
Bismuth Citrate.—8s. 6d. to 10s. 6d. per lb.
Bismuth Salicylate.—8s. od. to 10s. per lb.
Bismuth Subnitrate.—7s. 7d. to 9s. 7d. per lb.
Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
Bromides.—Potassium, 1s. 10d. per lb.; sodium, 1s. 11d. per lb.; ammonium, 2s. 1d. per lb. Market less firm. Prices uncertain.
Calcium Lactate—1s. 6d. to 1s. 8d., according to quantity. Fair demand and steadymarket.
Chloral Hydrate.—4s. per lb.
Chloroform.—2s. 6d. per lb. for cwt. lots.
Creosote Carbonate.—6s. 6d. per lb. Little demand.
Formaldehyde.—£48 to £49 per ton, in barrels ex wharf London. Supplies exceed demand.
Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 50%, 2s. 6d. per lb.
Guaiacol Carbonate.—9s. per lb. Reduced in price.
Hexamine.—3s. per lb. For bold crystal. Powder slightly less.
Homatropine Hydrobromide.—25s. to 30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydroquinone.—4s. 3d. per lb. in cwt. lots. Foreign make.
Hypophosphites.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate B.P.—1s. 11d. to 2s. 3d. per lb. Prices recently reduced.
Magnesium Carbonate.—Light Commercial, £36 per ton net. Light pure, £46 per ton.
Magnesium Oxide.—Light Commercial, £75 per ton, less 2½%; Heavy Commercial, £25 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity. Steady market.
Menthol.—A.B.R. recrystallised B.P., 57s. per lb., for December deliveries. No spot deliveries available. Synthetic, 26s. to 35s. per lb. according to quality, English make. Increasing demand.
Mercurials.—Market very quiet. Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 5d. to 3s. 7d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 3s. 10d. to 4s. per lb.
Methyl Salicylate.—1s. 9d. to 2s. per lb.
Methyl Sulphonel.—22s. per lb. Slightly weaker.
Metol.—11s. per lb. British make.
Morphine and Salts.—Reduced by 1s. to 1s. 3d. per oz.
Paraformaldehyde.—2s. 8d. for B.P. Quality.
Paraldehyde.—1s. 2d. to 1s. 6d. per lb., in free bottles and cases.
Phenacetin.—5s. 6d. per lb.
Phenazone.—6s. 10d. per lb.
Phenolphthalein.—5s. 3d. per lb. for cwt. lots. Again lower in absence of active buying.
Potassium Bitartrate 99/100% (Cream of Tartar).—86s. per cwt., less 2½% for ton lots.
Potassium Citrate.—1s. 10d. to 2s. 2d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb. Quiet.
Potassium Iodide.—16s. 8d. to 17s. 5d. per lb., according to quantity. Steady market.
Potassium Metabisulphite.—7½d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 7½d. per lb., carriage paid; commercial, 8d. to 8½d. per lb., carriage paid. Forward prices higher.
Quinine Sulphate.—2s.3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
Resorcin.—5s. per lb. In fair quantities. Supplies exceed demand.
Saccharin.—63s. per lb. in 50-lb. lots
Salol.—3s. per lb., for cwt. lots. Slightly lower, limited demand.
Silver Proteinate.—9s. per lb. for satisfactory product light in colour.
Sodium Benzoate, B.P.—2s. 6d. per lb. Supplies of good quality available.
Sodium Citrate, B.P.C., 1923.—1s. 11d. to 2s. 2d. per lb., according to quantity.
Sodium Hypophosphite, Photographic.—£13 to £15 per ton, according to quantity, d/d. consignee's station in 1-cwt. kegs.
Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—75s. to 82s. 6d. per cwt., according to quantity. Market quiet.
Sodium Salicylate.—Powder, 2s. 1d. to 2s. 3d. per lb, Crystal, 2s. 2d. to 2s. 4d. per lb. Flake, 2s. 6d. per lb. Strong demand, market firmer.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
Sodium Sulphite, anhydrous, £27 10s. per ton, minimum 5 ton lots, according to quantity, 1 cwt. kegs included.
Sulphonal.—14s. 6d. per lb. Little demand.
Thymol.—18s. per lb. Firmer market.

Perfumery Chemicals

Acetophenone.—11s. per lb. Cheaper.
Aubepine.—12s. 6d. per lb. Cheaper.
Amyl Acetate.—3s. per lb.
Amyl Butyrate.—6s. 6d. per lb.
Amyl Salicylate.—3s. 3d. per lb.
Anethol (M.P. 21/22° C.).—4s. 6d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 9d per lb.
Benzyl Alcohol free from Chlorine.—2s. 9d. per lb.
Benzaldehyde free from Chlorine.—2s. 9d. per lb.
Benzyl Benzoate.—3s. 6d. per lb.
Cinnamic Aldehyde Natural.—18s. 6d. per lb.
Coumarin.—17s. 3d. per lb.
Citronellol.—20s. per lb.
Citral.—9s. per lb. Dearer.
Ethyl Cinnamate.—12s. 6d. per lb.
Ethyl Phthalate.—3s. per lb.
Eugenol.—10s. 6d. per lb.
Geraniol (Palmarosa).—33s. 6d. per lb.
Geraniol.—12s. 6d to 20s. per lb.
Heliotropine.—6s. 9d. per lb.
Iso Eugenol.—16s. per lb.
Linalol ex Bois de Rose.—26s. per lb
Linalyl Acetate.—26s. per lb.
Methyl Anthranilate.—10s. per lb.
Methyl Benzoate.—5s. per lb.
Musk Ambrette.—50s. per lb.
Musk Xylol.—14s. per lb.
Nerolin.—4s. 6d. per lb.
Phenyl Ethyl Acetate.—15s. 6d. per lb.
Phenyl Ethyl Alcohol.—15s. 3d. per lb. Cheaper.
Rhodinol.—50s. per lb.
Safrol.—1s. 10d. per lb.
Terpineol.—2s. 4d. per lb.
Vanillin.—25s. to 25s. 6d. per lb.

Essential Oils

Almond Oil, Foreign S.P.A.—15s. 6d. per lb.
Anise Oil.—2s. 10d. per lb.
Bergamot Oil.—15s. per lb. Cheaper.
Bourbon Geranium Oil.—30s. per lb.
Camphor Oil.—65s. per cwt.
Cananga Oil, Java.—11s. 3d. per lb.
Cinnamon Oil, Leaf.—6½d. per oz.
Cassia Oil, 80/85%.—9s. 3d. per lb. Cheaper.
Citronella Oil.—Java, 85/90%, 7s. per lb. Ceylon, 3s. 4d. per lb.
Clove Oil.—8s. 3d. per lb.
Eucalyptus Oil, 70/75%.—2s. 2d. per lb.
Lavender Oil.—French 38/40% Esters, 35s. per lb.
Lemon Oil.—3s. 4d. per lb. Dearer.
Lemongrass Oil.—5s. 9d. per lb.
Orange Oil, Sweet.—11s. per lb.
Otto of Rose Oil.—Bulgarian, 42s. 6d. per oz. Anatolian, 28s. per oz.
Palma Rosa Oil.—17s. per lb.
Peppermint Oil.—Wayne County, 45s. per lb. Japanese, 23s. 6d. per lb. Dearer.
Petitgrain Oil.—9s. 9d. per lb.
Sandal Wood Oil.—Mysore, 26s. 7d. per lb. Australian, 18s. 6d. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, December 18, 1924.

THERE has been a considerable improvement in the volume of business transacted in the heavy chemical market during the past week, inquiries both for home and export being quite plentiful. Prices are on the whole steady, with perhaps a slight increase in continental quotations.

Industrial Chemicals

ACID ACETIC.—Glacial 98/100%, £57 to £68 per ton according to quality and packing. 80% pure quoted, £43 to £45 per ton. 80% technical, £42 to £44 per ton, packed in casks delivered c.i.f. U.K. port, duty free.

ACID BORACIC.—Remains unchanged. Crystal or granulated, £45 per ton. Powdered, £47 per ton, carriage paid U.K. stations, minimum lots.

ACID CARBOLIC, ICE CRYSTALS.—In little demand and price unchanged at about 6d. per lb. delivered.

ACID CITRIC, B.P. CRYSTALS.—In rather better demand. Now quoted 1s. 4½d. per lb. less 5%, ex store. Offered for prompt shipment from the continent at 1s. 4d. per lb., less 5%, ex wharf.

ACID FORMIC, 85%.—On offer at £50 per ton c.i.f. U.K. ports, duty free. Spot lots quoted £53 to £54 per ton, ex store.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80%.—£23 10s. per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—Offered from the continent at 3½d. per lb., ex wharf. Spot material unchanged at about 3⅞d. per lb., ex store.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works; full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Moderate inquiry and price unchanged at 11½d. per lb., less 5%, ex store.

ALUMINA SULPHATE 17/18% IRON FREE.—On offer at £6 15s. per ton c.i.f. U.K. port. Prompt shipment, spot lots available at about £7 10s. per ton, ex store.

ALUM.—Potash chrome alum 15% offered from the continent at £19 5s. per ton c.i.f. U.K. port. Ammonium chrome alum of British manufacture quoted £17 per ton f.o.b. U.K. port for export. Lump potash alum slightly higher at £8 15s. per ton c.i.f. U.K. port, spot lots about £9 15s. per ton, ex store.

AMMONIA ANHYDROUS.—Unchanged at about 1s. 6d per lb., ex station. Containers extra and returnable, with possible slight reduction for large quantities.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks delivered U.K. port.

AMMONIA LIQUID 880°.—In steady demand. Unchanged at 2½d. to 3d. per lb. delivered, according to quantity, containers extra.

AMMONIA MURIATE.—Grey galvanisers crystals of English manufacture quoted £30 per ton in casks, £29 per ton in bags, carriage paid stations. On offer from the continent at about £27 per ton c.i.f. U.K. port. Fine white crystals quoted £23 10s. per ton c.i.f. U.K. port.

ARSENIC, WHITE POWDERED.—Spot lots available at about £37 per ton, ex store. Offered for prompt despatch from works at about £36 per ton, ex wharf.

BARIUM CARBONATE 98/100%.—Offered from the continent at about £9 10s. per ton c.i.f. U.K. port.

BARIUM CHLORIDE, 98/100%.—Rather easier, at £12 10s. per ton, ex store, spot delivery, 93/95% offered from the continent at about £9 5s. per ton c.i.f. U.K. port.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton c.i.f. U.K. port.

BLEACHING POWDER.—Spot lots £11 per ton, ex station. Contracts, 20s. per ton less. Manufacturers advise reduction in price over next year of 10s. per ton.

BORAX.—Granulated, £24 10s. per ton; crystals, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations; minimum, ton lots.

CALCIUM.—English material unchanged at £5 12s. 6d. per ton, ex station. Continental slightly cheaper. Now quoted £4 15s. per ton c.i.f. U.K. port.

COPPERAS, GREEN.—Unchanged at about £3 5s. per ton, ex works, packed in casks, free

COPPER SULPHATE.—In little demand. British material for export quoted about £24 10s. per ton, f.o.b. U.K. port. Continental available on spot at about £23 10s. per ton, ex store.

FORMALDEHYDE 40%.—Spot material now quoted £48 10s. per ton, ex store, but little demand.

GLAUBER SALTS.—White crystal of English manufacture quoted £4 per ton, ex store or station.

LEAD, RED.—Spot material advanced to about £45 per ton, ex store.

LEAD WHITE.—Quoted £47 10s. per ton, ex store, spot delivery.

LEAD, ACETATE.—In good demand and price advanced to about £47 10s. per ton, ex store.

MAGNESITE CALCINED.—Unchanged at about £7 17s. 6d. per ton, ex station, prompt delivery. Hard burnt quality quoted £4 15s. per ton, ex station. Finer quality of continental manufacture quoted £7 15s. per ton c.i.f. U.K. port.

MAGNESIUM CHLORIDE.—Offered from the continent at £4 17s. 6d. per ton c.i.f. U.K. port.

POTASH CAUSTIC 88/92%.—Offered for prompt shipment from the continent at about £31 per ton, ex wharf, spot material available at £32 5s per ton, ex store.

POTASSIUM BICHROMATE.—Spot price unchanged at 5½d per lb. delivered. Price from January 1 next ½d. per lb. less.

POTASSIUM CARBONATE 96/98%.—Continental prices show slight increase. Now quoted £23 10s. per ton c.i.f. U.K. port. Spot material available at about £25 per ton, ex store.

POTASSIUM CHLORATE.—Spot material unchanged at about 2¾d. per lb., ex wharf. On offer for prompt shipment from the continent at 2½d. per lb. c.i.f. U.K. port.

POTASSIUM NITRATE, SALTPETRE.—Quoted £26 per ton, c.i.f. U.K port, prompt shipment from the continent. Spot lots on offer at £28 15s. per ton, ex store.

PERMANGANATE, B.P. CRYSTALS.—Now offered from the continent at about 8d. per lb., ex wharf. Spot material available at about 8¼d. per lb., ex store.

PRUSSIATE, YELLOW.—Spot material advanced to about 7½d. per lb., ex store. On offer for prompt shipment from the continent at slightly less.

SODA, CAUSTIC.—76/77%, £19 7s. 6d. per ton. 70/72% £17 17s. 6d. per ton. 60/62% broken, £19 2s. 6d. per ton. 98/99% powdered, £22 15s. per ton. All ex station spot delivery. Contracts 20s. per ton less. Manufacturers advise the following reductions for next year—76/77% 27s. 6d. per ton; 70/72%, 25s. per ton; 98/99% powdered, 27s. 6d. per ton.

SODIUM ACETATE.—In little demand. Quoted £23 7s. 6d. per ton, ex store, spot delivery. On offer from the continent at about £22 10s. per ton c.i.f. U.K. port.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Spot lots unchanged at 4½d. per lb. delivered. Reduction of ½d. per lb. from January 1 next.

SODIUM CARBONATE.—Soda crystals, £5 to £5 per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more; alkali 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—English material unchanged at £10 per ton, ex station. Continental quoted £8 10s. per ton c.i.f. U.K. port. Spot lots available at about £9 15s. per ton, ex store. Pea crystals of English manufacture unchanged at £13 15s. per ton, ex station.

SODIUM NITRATE.—Ordinary quality quoted £13 17s. 6d. per ton, ex store. 96/98% refined quality, 7s. 6d. per ton extra.

SODIUM NITRITE 100%.—Unchanged at about £25 10s. per ton, ex store.

SODIUM PRUSSIATE, YELLOW.—Moderate inquiry and price unchanged at about 4d. per lb., ex store. Offered for prompt shipment from the continent at about 3⅞d. per lb. c.i.f. U.K. port.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per, ton f.o.r. works; good inquiry for export.

SODIUM SULPHIDE.—English manufacturers advise slight advance in prices for next year. 60/65% solid, £15 per ton; broken, £1 per ton more; flake, £2 per ton more. Crystals 31/34%, £9 5s. per ton, all carriage paid stn., minimum 4 ton lots, with a slight reduction for contracts over a period. Continental solid material 60/62% quoted £12 10s. per ton c.i.f. U.K. port. 30/32% crystals £8 15s. per ton c.i.f. U.K. port.

SULPHUR.—Flowers, £9 10s. per ton; roll, £8 10s. per ton; rock, £8 7s. 6d. per ton; ground, £8 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—98/98% of continental manufacture quoted £23 per ton c.i.f. U.K. port. English material for export on offer at about £25 to £26 per ton, f.o.b. U.K. port.

ZINC SULPHATE.—Unchanged at £12 15s. per ton, ex store, spot delivery.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHYLAMINE.—Some home and export inquiries. Price 1s. 3½d. per lb.

AMIDO AZO BENZOL HYDROCHLORIDE.—Some home inquiries. Price, 5s. 3d. per lb. delivered.

H. ACID.—Moderate home demand. Price, 3s. 10d. per lb., 100% basis, carriage paid.

S. S. Acid.—Some home inquiry. Price, 13s. per lb. on 100% basis, carriage paid.

Beta Naphthylamine.—Some export inquiries. Price, 3s. 10d. per lb. f.o.b.

Dimethyl Aniline.—Small home inquiries. Price, 2s. 4d. per lb. delivered.

Gamma Acid.—Some export inquiry. Price, 10s. per lb., 100% basis, f.o.b.

Meta Toluylene Diamine.—Some export inquiry Price, 3s. 10d. per lb., f.o.b.

The Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, December 18, 1924.

There has been comparatively little movement in the market for chemical products here and this quieter feeling, which is largely seasonal, may be expected to continue until about the second week in January. From a business point of view next week will be practically a dead one. Taking them generally values are keeping remarkably steady and in one or two instances there is a distinctly firm tendency. Even the coal-tar products, with the exception of carbolic acid, show a healthier tone.

Heavy Chemicals

Prussiate of soda meets with a moderate demand and prices are firm at 4d. to 4¼d. per lb. Soda crystals are quiet though values are maintained at £5 5s. per ton. Sodium sulphide is not particularly active but little or no change in quotations can be reported; 60–65 per cent. concentrated solid is on offer at round £14 per ton, and crystals at £9 5s. to £9 10s. per ton. Hyposulphite of soda is in limited request at £13 10s. to £13 15s. for photographic crystals and about £9 10s. per ton for commercial. Caustic soda has met with a fair inquiry, with next year's contract deliveries reduced to from £14 12s. 6d. per ton for 60 per cent. material to £17 for 76–77 per cent., with a premium of £1 per ton for odd parcels. Saltcake and Glauber salts still attract comparatively small attention though both are quotably unchanged at £3 10s. per ton. Bleaching powder is only in moderate inquiry at £9 10s. to £10 per ton for 1925 delivery. Phosphate of soda is in small demand at £13 per ton. Bicarbonate of soda is quiet but steady at £10 10s. per ton. Bichromate of soda meets with a moderate demand at 4d. per lb. Chlorate of soda is fully maintained at 2½d. per lb., and a fairly active inquiry for this material has been met with. Alkali is in moderate request with values unchanged at about £6 15s. per ton. Acetate of soda is quiet and easy at round £22 per ton.

Values of caustic potash and carbonate of potash are steady although in neither case has there been much actual business during the week. Caustic potash is offering at from £30 to £31 per ton for 90 per cent. material and carbonate at about £23. Bichromate of potash is rather quiet at the moment at the reduced price of 5d. per lb. Prussiate of potash is firm at 7d. per lb., with a fair amount of interest in this material being shown. Permanganate of potash also shows strong tendency, with current values ranging from 7d. to 7¾d. per lb., according to quality. Chlorate of potash is steady and fairly active at 2¾d. per lb.

Arsenic continues quiet but values if no better are certainly no worse than at last report, about £38 per ton, Manchester, being currently quoted for white powdered, Cornish makes. There is not much movement in sulphate of copper and prices are easy at £24 to £24 10s. per ton, f.o.b. Commercial Epsom salts are quiet but steady at £4 15s. per ton; magnesium sulphate, B.P., is offering at round £6 10s. per ton. Prices of lead compounds are well held in sympathy with the metal. Nitrate of lead is quoted at £42 to £43 per ton, and acetate of lead at £46 10s. for white and about £43 per ton for brown. Acetate of lime is quiet but unchanged from last report at £15 10s. per ton for grey and about £11 for brown quality.

Acids and Coal Tar Products

In the acids section values are steady on the whole, though business is not too brisk. Tartaric acid is quoted at 11½d. per lb., or a fraction over this, and citric acid at about 1s. 4½d. per lb. Acetic acid is maintained at £42 to £43 per ton for 80 per cent. commercial and round £68 for glacial. Oxalic acid is quiet at 3⅞d. to 4d. per lb.

The outlook for pitch continues brighter, with prices steady in the neighbourhood of £2 15s. per ton. Naphthalenes are about unchanged at £15 10s. per ton for refined and from £5 per ton for crude material. Cresylic acid is still on offer at 2s. 1d. per gallon. Carbolic acid is very quiet and more or less nominal at 5¼d. to 5½d. per lb. for crystal and 1s. 8d. per gallon for crude. Solvent naphtha keeps very firm at about 1s. 6½d. per gallon. Cresote oil is steady at 5¾d. to 6d. per gallon.

Tariff Changes

Newfoundland.—Gasoline is now entitled to duty-free admission. An Act empowers the abrogation of duties now levied on molasses and kerosene oil when the financial condition of the Colony warrants it.

Sierra Leone.—The exportation of gum copal is prohibited for three years. The import duty on sugar has been reduced from 3d. to 1d. per lb.

Czechoslovakia.—Reductions in duty resulting from the Convention with Italy include the following articles:—Boric acid, refined; tartaric and citric acids, refined borax, rice starch and rice starch flour, and starch glaze.

Sulphate of Ammonia from Leather Waste

In leather centres ammonia is extracted from the refuse by heating it strongly over lime; in some cases soda lime is used in preference to quick lime, according to *The Leather World*. The liquid ammonia must be purified before sale as a cleansing agent. By a slight adaptation of the process, sulphate of ammonia can be prepared. The gas, instead of being led into water, is led into sulphuric acid and the subsequent salt purified by recrystallisation and sublimation.

Leather dust may be used as a manure, and may with advantage be added to fertiliser mixtures. Briquettes can readily be prepared from leather dust, sawdust and cinders, mixed with glue. Firelighters can also be manufactured by the addition of crude naphthalene to a mixture of refuse and sawdust.

Prices of British Dyestuffs

Mr. A. Watkin, speaking as chairman of S. Barlow and Co., in Manchester, on Friday, December 12, said the 10 per cent. reduction in dyeing charges made by the British dyeing firms last August in the hope of retaining some of the dyeing and printing business in this country that was now going abroad, had not brought his firm one single additional piece to be dyed, although one or two new dyes suitable to the Lancashire trade had been brought out by the British Dyestuffs Corporation. The trade were still dependent for their most important colours on foreign manufacturers, and British firms were having to pay higher prices for such imported colours than their competitors in Italy and Holland, with the result that those countries were securing orders that came formerly to this country.

Chemical Matters in Parliament

Food Preservation

Sir E. Hume-Williams (House of Commons, December 11), asked the Minister of Health whether, in view of the danger involved in the growing use of preservatives in food imported or otherwise, he would take an early opportunity of introducing legislation on the subject.

Mr. N. Chamberlain said that he was advised that the majority of the recommendations of the Committee could be carried out by Regulation, and he was then engaged on the draft of suitable regulations.

The B.D.C.

Sir P. Cunliffe-Lister (House of Commons, December 16), replying to a question, said that he understood that the queston of the financial reorganisation of the British Dyestuffs Corporation had been receiving for some time the attention of the board of the corporation. They had been informed that the Government were prepared to give favourable consideration to any reasonable scheme with that object in view which might be put forward.

Sir P. Cunliffe-Lister (House of Commons, December 16), in reply to a question concerning the fees of the directors of the British Dyestuffs Corporation, said that the Government directors of the British Dyestuffs Corporation received the same remuneration as the ordinary directors. This applied to the recently appointed Government Director, but he had no information of any special arrangement as to the chairman of the Corporation.

Company News

DOMINION GLASS CO.—A quarterly dividend of 1¾ per cent. is announced.

ASBESTOS CORPORATION OF CANADA.—A dividend of 1½ per cent. on the preferred stock for the quarter ending December 31 is announced, payable on January 15.

COURTAULDS, LTD.—A dividend on the 5 per cent. cumulative preference shares will be paid on January 1 next to shareholders on the books of the company at the close of business on December 11.

LONDON NITRATE CO.—The trading profits for the year ended June 30 last amounted to £107,214, which compares with £80,377 for the preceding year. Consequently the allocation to debenture redemption receipts is increased from £30,000 to £50,000 and the dividend raised from 2s. 6d. to 4s. per share, free of tax, which allows of £16,418 being carried forward.

UNITED INDIGO AND CHEMICAL CO., LTD.—The directors announce the following interim dividends: At the rate of 5 per cent. per annum for the six months ending December 31, 1924, on the participating cumulative preference shares and at the rate of 5 per cent. per annum for the six months ending December 31 on the ordinary shares, less tax. Both dividends are payable on December 31.

BRUNNER, MOND AND CO., LTD.—The directors have issued to the shareholders an invitation to subscribe for an unadvertised issue of 175,000 7½ per cent. cumulative preference shares at par in the Madeley Collieries, Ltd., a company formed to acquire for £350,000 the colliery and brickworks of Leycetts, near Madeley, Staffordshire. Half the ordinary shares are held by Brunner, Mond, and the purchase price will be satisfied half in cash and half in ordinary shares.

BRITISH PLATINUM AND GOLD CORPORATION.—The report for the year ending July 31 last states that, after allowing for depreciation on plant, etc., there has been a profit of £49,985, which, together with the sum of £51,583 brought in, but less the interim dividend paid on July 2 amounting to £29,830, makes a total of £71,738. The general reserve account remains at £33,492. An interim dividend of 1s. per share, less tax, was paid on July 2, 1924, and directors now recommend a final dividend of 6d. per share, less tax, making 1s. 6d. per share for the year.

SULPHIDE CORPORATION, LTD.—The net profit for the year ended June 30 last, excluding all expenditure incurred in connection with the Central Mine fire, amounted to £84,142, to which has been added £100,000 over-provided in former years against taxation. Capital expenditure in excess of amortisation amounted to £183,942, and after debiting this against revenue there remains a credit balance of £200 to be dealt with in the next account. The cost to date of combating the fire in the Central Mine has amounted to £187,123, which has been provided out of the reserve for contingencies, reducing that reserve to £92,877. The annual meeting will be held on December 23, at Winchester House, London.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

MARKET FOR PAINTS.—A confidential report on the market for paints, varnishes, etc., in Mexico has been prepared by the D.O.T., and issued to firms whose names are entered upon its Special Register. British firms desirous of receiving a copy of this report should communicate with the D.O.T. (Reference No. B.X./1378).

COCONUT OIL.—An agent in Zurich is desirous of obtaining the representation of a British firm, on a commission basis, for the sale in Switzerland of coconut oil. (Reference No. 623.)

SOAP.—The Egyptian War Department is calling for tenders for palm oil soap. Particulars from the Inspecting Engineer, Egyptian Government, Queen Anne's Chambers, London, S.W.1. Tenders by December 31. (Reference Muh. 1924/74/6.)

PORTLAND CEMENT.—Tenders are invited for supply and delivery of about 175 tons Portland cement of English manufacture at Tooting Bec Hospital extensions, Church Lane, Tooting, for the Metropolitan Asylums Board. The specification and form of tender may be inspected and obtained at the Office of the Board, Victoria Embankment, London, E.C.4.

HEAVY CHEMICALS.—An old-established firm in Berlin-Charlottenburg desire to secure the representation of British manufacturers or exporters of heavy chemicals. This is a repetition of a notice which appeared in the *Journal* of November 13. (Reference No. 647.)

CHINA CLAY, CRUDE RUBBER.—A commission agent in Stockholm desires to secure the representation for Sweden of British exporters of china clay for paper mills and crude rubber. (Reference No. 658.)

PALM OIL, ETC.—A firm of commission agents in Cairo desire to represent British firms exporting palm oil of West African origin, household and toilet soap, and linseed oil (double boiled). (Reference No. 660.)

COPRA, OIL SEEDS, ETC.—A commission agent in Christiania desires to secure the representation of British exporters of copra, soya beans, babassu kernels, and other oil seeds; and also vegetable oils for use in the manufacture of margarine and soap. (Reference No. 656.)

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information can be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to January 17, 1925.

"CARBOLINEUM."

443,803. For wood preservatives. C. A. Peters, Ltd., Stores Road, Derby, Derbyshire; manufacturers, merchants and exporters. December 19, 1923. (To be Associated, Sect. 24.) Advertised before acceptance, the applicants alleging distinctiveness.

"TAPCELAIN."

453,855. For chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Lewis Berger and Sons, Ltd., 201, Morning Lane, Homerton, London, E.9; manufacturers. November 21, 1924.

"HORO."

447,646. For chemical substances and compositions evolving gases or vapours for fumigation or like purposes. Class 2. Deutsche Gold-and-Silver-Scheideanstalt Vorm, Roessler (a Joint Stock Company, organised under the laws of Germany), 7, Weissfrauenstrasse, Frankfurt-on-Main, Germany; chemical manufacturers. April 22, 1924.

"FLORANID."

453,171. For chemical substances used for agricultural, horticultural, veterinary and sanitary purposes. Class 2. Badische Anilin and Soda Fabrik (a Joint Stock Company, organised under the laws of Germany), Friedenheimerstrasse, Ludwigshafen-on-Rhine, Germany; manufacturers of alizarine, aniline dyes, artificial indigo and chemicals. October 30, 1924.

"AGOROL."

452,362. For raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures. Class 4. Burrell and Co., Ltd., Burrell's Wharf, Millwall, London, E.14, and 40, Trinity Square, London, E.C.3; colour and varnish makers, oil boilers and refiners. October 2, 1924.

A Booklet on Bleaching

THE firm of B. Laporte, Ltd., Luton, has issued an interesting booklet on *Hydrogen Peroxide and Bleaching*, in which an account is given of the discovery of H_2O_2, of its chemical properties, of its use in bleaching, and of the "Laporte Indicator," which is intended to replace the familiar litmus paper test.

Czechoslovakia's Mineral Industry

THE following official figures are of interest as showing the output of the principal minerals since the formation of the Republic. For the purpose of comparison similar statistics for the last complete pre-war year, 1913, are shown.

	1913.	1919. Metric tons.	1920.
Lignite	23,017,096	17,323,960	19,956,610
Hard coal	14,271,408	10,254,233	11,374,953
Total	37,288,504	27,578,193	31,331,563
Iron ore	988,931	983,416	1,053,123
Gold	35,994	13,177	17,792
Silver	19,937	44,382	48,335
Graphite	32,175	30,546	22,925
Salt	—	4,944	30,989
Naphtha	—	7,126	10,110
Manganese ore	—	45,693	50,294

	1921.	1922. Metric tons.	1923.
Lignite	21,335,127	19,174,296	16,265,529
Hard coal	12,023,209	10,464,989	12,347,251
Total	33,358,335	29,639,286	28,612,780
Iron ore	800,829	313,149	675,185
Gold	31,120	19,851	13,943
Silver	53,939	49,463	18,293
Graphite	13,522	10,500	9,873
Salt	91,198	128,178	134,080
Naphtha	14,065	18,298	10,848
Manganese ore	43,540	23,556	42,053

The figures are given in metric tons transposed from the officially issued Statistical Bulletins of the Czechoslovak Government. It will be noted that salt and manganese are shown as being produced in Czechoslovakia only since the war. This is accounted for by the fact that these minerals are exploited in the Slovak portion of the Republic, and pre-war statistics of production—viz., Hungarian—are not at the moment available.

Chemicals in Food

MR. JOHN EVANS, a well-known public analyst of Sheffield, speaking to the Liverpool Chemists' Association on the question of food adulteration, said that the objection of the public to the taste of common salt in excess necessitated the use of other preservatives, the danger of which was that they might be consumed in such a quantity as to be poisonous. It was to be hoped that the various health authorities would press for legislation to enable the setting up of national standards of preservatives. There were no limits, except as to milk, in which preservatives were forbidden, and cream, to which an addition of 0·4 was allowed, with restrictive regulations. He had found 3½ to 4½ grains of preservatives per pint in "non-alcoholic" wines, an excessive quantity, especially seeing that the wine was "for invalids." In polished and whitened rice he had found ultramarine and analine dyes and mineral oil, impurities which the consumer ought not to be depended upon to remove by washing with water. Bleaching of flour gave whiteness without any guarantee of quality.

He wished to know why the poorest people flavoured their food with what he termed "artificial vinegar"—acetic acid coloured. Colouring matters were added to various foods to increase the attractiveness to the eye, but the consumer had a right to know what changes were effected. Tinned goods were apt to be contaminated by tin from the canister and lead from the solder, the amount of contamination being determined both by the acidity of the food and the quality of the tin. He described the difficulties of the analytical tracing of arsenic in beer. In bran and sharps he had lately found the repetition to the extent of 15 to 30 per cent. of a form of adulteration supposed to have been abandoned twenty years ago. Having suggested to pharmacists some means of detecting any adulteration of drugs, he augured that the constant bombardment of adulteration would lead eventually to its abandonment in favour of entire purity.

In the discussion, condemnation was expressed of the "coppering of peas to make a finer colour than that of fresh peas" and the use of deleterious substances in baking powders.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

ACME CHEMICAL CO., LTD., Tonbridge. (M., 20/12/24.) Registered December 1, £3,000 mortgage to T. P. Banks, Manor Farm, Yalding, farmer; charged on property at Vale Road E., Tonbridge. *£2,000. April 8, 1924.

MORTON (J. AND B.), LTD., Grasmere, dyers and bleachers, etc. (M., 20/12/24.) Registered December 3 (by order on terms), £2,650 mortgage, to J. Graham and others, Hawksdale, farmers; charged on properties at Sunnyside Lane, Lancaster, etc.

SOCLEANO, LTD., London, E., soap manufacturers. (M., 20/12/24) Registered December 2, £500 debenture to A. E. Abrahams, 5, Shaftesbury Avenue, W., theatrical proprietor; general charge. *Nil. October 9, 1924.

Receivership

SOMERSET OXIDE AND OCHRE CO., LTD. (R., 20/12/24.) R. E. G. Dovey, C.A., was appointed receiver and manager by the debenture holders on December 12.

Bill of Sale

ADCOCK, Robert Page, 41, Oakfield Street, Cardiff, manufacturer of disinfectant fluids and general merchant. B.S., 20/12/24.) Filed December 15. £300.

London Gazette, &c.

Bankruptcy Information

WATTSON, George Herbert, 133, Fenchurch Street, London, E.C., chemical manufacturer. (R.O., 20/12/24.) Receiving order, December 11. Creditor's petition. First meeting, December 31, 12 noon. Public examination, February 3, 1925, 11 a.m., Bankruptcy Buildings, Carey Street, London, W.C.2.

New Companies Registered

COOKSON LEAD AND ANTIMONY CO., LTD. Lead, copper, zinc, spelter and antimony smelters and refiners; manufacturers of white and red lead, litharge, lead pipes and sheets, etc. Nominal capital, £400,000 in £1 shares. Solicitor: J. G. E. Wilkinson, 1, Mosley Street, Newcastle-on-Tyne.

ELECTRO PLATERS' SUPPLY CO., LTD. Manufacturers of and dealers in all kinds of plating and polishing plants, machinery, materials, etc.; chemists, analysts, drysalters, refiners and manufacturers of and dealers in chemicals, lacquers, metallic salts, varnishes, acids, etc. Nominal capital, £100 in £1 shares. Secretary: J. Menzies, 9, Cross Street, Hatton Garden, London.

J. H. LAVENDER AND CO., LTD. Metal founder, heat treatment and general engineer, tester of metals, metallurgical and analytical chemist. Nominal capital, £4,000 in £1 shares. A director: J. H. Lavender, "Charlemont," West Bromwich.

PHARMACOPOEIAN FORMULAE, LTD., Vernon House, 40, Shaftesbury Avenue, London. Chemists, druggists, chemical manufacturers and dealers, drysalters, importers and manufacturers of and dealers in pharmaceutical and medicinal preparations and their constituents. Nominal capital, £6,000 in 1s. shares.